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THE

LONDON NATURALIST



The Journal of the
LONDON NATURAL HISTORY SOCIETY

FOR THE YEAR
1931

PRICE THREE SHILLINGS

PUBLISHED BY THE
LONDON NATURAL HISTORY SOCIETY,
THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE,
KEPPEL STREET, GOWER STREET, LONDON, W.C.1.

1932.

London Natural History Society.

Founded 1858

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THE RIGHT HON. THE VISCOUNT GREY OF FALLODON, K.G., P.C.

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F.E.S., F.Z.S.; H. SPOONER.

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H. J. HUSSEY; H. A. LITTLEJOHN; B. T. WARD; C. WEEKS.

The Society is affiliated to the South-Eastern Union of Scientific
Societies, the National Trust and the Commons and Footpaths Pre-
servation Society.





JOHN CUTHBERT ROBBINS.

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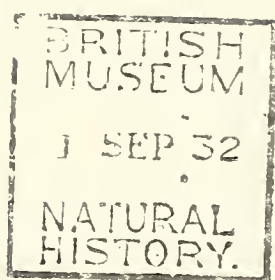
T. BUNCLE & Co., ARBROATH.

1932.



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Editorial Notes.

THE sad death of Mr J. C. Robbins, the Publications Secretary and Editor, on 11th April 1932, is referred to on another page of this issue. The present volume was largely put together by him, but certain improvements which we know that he had in mind have not been included, as their reconstruction would have been difficult in the time at our disposal.

The Publication Committee desires again to thank those members of the Society whose generous donations to the London Naturalist Fund have made it possible for the present volume to be published. But for their continued support the *London Naturalist* would inevitably be reduced to little more than the official reports of the Society and its Sections. The membership of the Society will have to be considerably increased before the income from subscriptions at their present figure is sufficient to meet the entire cost of the Society's Journal in addition to all other ordinary expenditure.

The publication of the Botanical Records is resumed in the present volume, and it is hoped that it will be possible to proceed with this regularly until they are completed. The attention of new members is drawn to the reprints of the first three parts, which can be obtained from the Librarians, price 6d each. Part 1 contains a description of the Divisions of the Society's area referred to in the records, with a definition of their boundaries. The boundaries are shown on the map of the area, which can also be obtained from the Librarians, price 1d.

It has been decided to omit from the Sectional Reports, as far as possible, all scientific records and observations, and to place these with the contributed articles in the second part of the volume, where several pages will be devoted to short notes. All members are invited to send to the Editors or the Sectional Secretaries notes for these pages. Many of the shorter communications made at our meetings, which would not otherwise appear in print, would be acceptable.

The address delivered by the retiring President, Mr L. J. Tremayne, in December, contained many valuable suggestions for improving the work and status of the Society. Careful consideration is being given by the Council to these suggestions, some of which will, it is hoped, be acted upon in the present year.

Mrs H. Boyd Watt was again the Society's delegate to the South-Eastern Union of Scientific Societies, and took an active part in the work of the 36th Congress, which was held at Winchester in June 1931.

In connection with the affiliation of the Society to the National Trust, which was mentioned last year, members are asked to communicate with Mr W. C. Forster if any cases come to their notice of open spaces, historic buildings, etc., in the Society's district, that are in danger of destruction or needless spoliation.

The Annual Exhibition was held on 20th January and attracted a large gathering to listen to the two lectures, and to view the exhibits displayed in an adjoining room. Among the Exhibitors were:—Ornithology, Mrs Boyd Watt, the Misses G. Lister, A. Hibbert-Ware, and C. M. Acland, Mr Roland Green, and the Committee of the Section. Archaeology, Messrs W. C. Cocksedge, G. J. B. Fox, and A. J. Mason. Botany, Mrs Dallas, Messrs R. W. Robbins, J. Ross, and H. Spooner. Geology, Mr A. J. Haywood. Plant-galls, Messrs K. G. Blair, and H. J. Burkill. Entomology, Messrs E. A. Aris, H. J. Burkill, C. L. Collette, A. Richardson, R. W. Robbins, J. C. Robbins, C. B. Smith, G. Talbot and J. J. Joicey, and C. H. Williams.

Mr Roland Green's exhibition of pictures at the Ackermann Galleries, New Bond Street, has now become a recognised annual event and source of pleasure to ornithologists. Mr Green has always shown a particular talent for the portrayal of the most difficult aspect of bird-portraiture—flight—and it is significant that in his exhibition in November 1931 over half of the pictures shown were of birds on the wing. He has a happy faculty for creating an atmosphere, and those who know and love the Norfolk Broads can well recall their enchantment from his pictures, a striking instance being "Mist rising on the Broads—Mute Swans." Other noteworthy pictures shown were "Clear Cut against the Frosty Sky—Pochard;" "Over the Sand Dunes—Shelduck," and "Resting Snipe," where the evident sleepiness of the birds is very cleverly portrayed. There are several additions to the collection of etchings—fourteen in all being shown. This method of treatment is particularly suited to the delicacy of bird plumage, and under Mr Green's hand the result is delightful.

During the year appeared the second edition of Dr G. Carmichael Low's book on "The Literature of the Charadriiformes," the first edition of which appeared in 1924. The author has made a valuable contribution to scientific ornithology, compressing into some 640 pages a mass of detail concerning the Waders, Bustards, Snipe and Plovers.

Some excellent additions to the well-known Roland Green bird post-cards have recently been published by the R.S. Art Press Ltd., 29 Ludgate Hill, E.C.4. The two new series (8 and 9) comprise—Bar-tailed Godwit, Common Gull, Common Guillemot, Barn Owl, Coot, and Dunlin; Reed Bunting, Pied Flycatcher, Wheatear, Swallow, Grey Wagtail, and Lapwing. They show that the standard of merit achieved has progressed with the series. Though the softness of colouring and line which characterises Mr Green's bird pictures could not be expected in a post-card, the paintings have been excellently reproduced. They are an attractive and well-worth-while investment for every bird lover.

It is perhaps not known as widely as it might be that various scientific periodicals are circulated amongst groups of members, who share the cost of the annual subscriptions. By this means any member can keep in touch with the current literature of his special subjects at a small cost. The following is a list of the publications at present circulated in this way, with the approximate annual contribution required and the name of the member responsible:—

Antiquity. (Quarterly.) W. C. Forster, 2/6.

British Birds. (Monthly.) Mrs Clanchy, 2/6.

Botanical Society and Exchange Club of the British Isles, Report. (Annual.) B. T. Ward, 1/-.

Entomologist. (Monthly.) R. Marshman Wattson, 2/-.

Entomologist's Monthly Magazine. R. Marshman Wattson, 2/-.

North Western Naturalist. (Quarterly.) H. J. Burkill, 1/-.

Reviews.

The Grey Squirrel. By A. D. Middleton. (Sidgwick & Jackson, 4/6 net.)

Anyone who has been fortunate enough to see and watch young Red Squirrels at play in their natural surroundings will be prepared to encourage their existence for the pure joy of seeing them, in spite of the damage the species may do to young Conifers. He will allow them to remain unmolested in the woods so long as their numbers do not become excessive, but his feelings with regard to the Grey relative may well be different. It has not the charm of the Red species, and the crimes attributed to it by most people produce a feeling of antipathy, except in a few places where it is felt that a limited number can be allowed to live and breed without becoming a nuisance, and where a large amount of their food is supplied by the public as in Regent's Park.

The case for and against the American intruder is clearly put in a book recently written by Mr A. D. Middleton, of Oxford University. The author deals with the various introductions of these animals into this country, their increase in numbers and consequent appearance in fresh territory, their life history, food, their relations to the Red Squirrel and to man and his handiwork in those places where rival interests come into conflict.

In these days when a considerable amount of attention is being given to the question of ecto-parasitism as showing the ancestry of various members of the animal kingdom, Mr Middleton's remarks in chapter iv on the parasites of the Grey Squirrel are most interesting.

The book is one that can be profitably read by all landowners, and by any one whose inclinations take them out into the fields and woods, especially in those areas where the animal has obtained a footing.

Flowers of Grass. By Robert Fisher, M.A., Canon of York. (Wheldon & Wesley, 2/-.)

Young field botanists, and even those otherwise well acquainted with the flora of the countryside, often hesitate to tackle the grasses, the most ubiquitous and certainly the most important of the vegetable orders. Doubtless the simplest way to learn grasses is to accompany a friend well acquainted with the order into the field, and study with him their

characters and structure on the spot. Unfortunately the learned friend is seldom available just when most wanted, but Canon Fisher's little book, conveniently carried in the pocket, and supported with patience and a good pocket lens, will do much to meet the need.

A brief introduction and some sketches sufficiently show the structural characters to be examined. The remainder of the book consists of a key, in three forms, for determining the genus, and a list of the British species, under their genera alphabetically arranged, giving the specific characters. Numerous abbreviations are used, and, although a full table is provided, one doubts whether they were all necessary.

It is essentially a book for use in the field. In dried and shrivelled herbarium specimens, the presence and the insertion of the awn, for example, important as it may be, is often difficult to detect. With the living plant before one, the difficulty is reduced to a minimum. As a field naturalist's companion, the book is warmly recommended.

Papers Read to the Society.

THE list of papers read at the indoor meetings held in 1931 is given below. We desire to express our thanks to the visitors who kindly came to lecture to us.

- Jan. 6—"Notes on the Fauna of Australia,"
E. J. Bryce, F.R.G.S., R.A.O.U.
- Jan. 20—Annual Exhibition.
(1) "Some Birds in Orkney,"
Miss M. G. L. Best, F.Z.S., M.B.O.U.
(2) "Some Studies by Photomicrography,"
Arthur J. Mason, F.R.S.A.
- Feb. 3—"A Naturalist in British Somaliland,"
C. L. Collenette, F.R.G.S., F.E.S.
- Mar. 3—"Finland and its Birds,"
E. C. Stuart Baker, J.P., O.B.E., M.B.O.U.
- Mar. 31—Bacot Memorial Meeting.
"Plague: A Study in Medicine and Natural History,"
P. A. Buxton, M.A., M.R.C.S.
- May 5—"Some Treasures of Westminster Abbey,"
L. E. Tanner, M.A., F.S.A.
- Sept. 22—"A Rambler in Siam," Mrs Norman Lowe.
- Oct. 6—"Humbug in Ornithology and Entomology," ... C. S. Bayne.
- Nov. 24—"Some English Sculptors of the 17th and 18th Centuries,"
Mrs Esdaile.
- Dec. 1—Annual General Meeting.
President's Address—"The Society and its Future,"
L. J. Tremayne, F.Z.S.
- Nov. 3—Exhibition of Ciné Films (by arrangement with British Instructional Films, Ltd.).

PAPERS READ AT SECTIONAL MEETINGS.

- Feb. 17—Archaeology. "The Churchyard Yew,"
Walter Johnson, F.G.S.
Ornithology. "Hérons and other Birds," ... H. N. Southern.
- Mar. 17—Botany. "Perfumes and Volatile Oils," G. R. A. Short.
Entomology. "Aquatic Hymenoptera," Mrs K. Grant.
- April 21—Plant Galls. "Sawfly Galls on *Salix*,"
R. B. Benson, M.A., F.E.S.
Ramblers. "Notes on Trees," B. T. Ward.
- May 19—Entomology. "A Naturalist's Notes from Costa Rica,"
W. J. Kaye, F.E.S.
Ornithology. "Romney Marsh and its Birds,"
H. Lambert Lack, M.D., F.R.C.S.
- June 2—Ramblers. "The London School of Hygiene and Tropical
Medicine," Prof. Jamieson.
- June 16—Archaeology. "Views of French Gothic Churches,"
W. C. Forster.
Plant Galls. "Galls to be looked for,"
H. J. Burkill, M.A., F.R.G.S.
- Sept. 8—Botany. "Some Preliminary Remarks on Brambles,"
R. W. Robbins.
- Sept. 15—Ramblers. "Peasant Life in Alpine Districts,"
J. E. S. Dallas.
- Oct. 13—Plant Galls. "More Galls to be looked for,"
H. J. Burkill, M.A., F.R.G.S.
- Oct. 20—Ornithology. "Some Structural Observations on the Waders
and their Bearings on the Classification of the Family,"
G. Carmichael Low, M.A., M.D., F.R.C.P., F.Z.S., M.B.O.U.
- Nov. 10—Archaeology. "Romanesque Churches of South Italy,"
Rev. R. F. Andrews.
- Nov. 17—Botany. "Common Wall Mosses," J. Ross.
- Dec. 8—Ramblers. "The Pilgrim's Way," A. L. Simpson.
- Dec. 15—Entomology. "An Entomological Medley," E. A. Aris, F.Z.S.
- Dec. 22—Plant Galls. "An Introduction to the Study of Plant Galls,"
H. J. Burkill, M.A., F.R.G.S.

Council's Report, 1931.

THE year 1931 has continued the increasing prosperity of the Society, and every branch of its activities has shown gratifying results. The research work and records of the various Sections have been well maintained and the membership has shown a very healthy growth, no fewer than 52 new members having been elected, while 11 have fallen out, showing a net gain of 41. Both the Country and School and Branch Associates show an increase in numbers, while of those who have ceased associateship all have done so to become full members.

The new Headquarters at Keppel Street continue to be appreciated, being more conveniently appointed for our purpose in every respect than the old ones in the City. The attendance at indoor meetings has increased to an average of 81.75, which is the highest we have yet attained; there is still room for improvement in this respect, however, and it is to be hoped that yet more members will attend EACH meeting.

The Syllabus, arranged by Mr J. B. Foster, maintained again the high level to which we have become accustomed. Special mention should be made of the Bacot Memorial Evening, when Dr Buxton, of the London School of Hygiene and Tropical Medicine, provided a special demonstration and gave the lecture, a summary of which appears elsewhere. Another most successful meeting was that of 3rd November, when a series of ciné films was shown in the large Lecture Theatre, which was filled almost to capacity.

The Library has continued to flourish under the zealous care of Messrs Pethen and Mann; the time has come when it will be necessary to issue a new catalogue of the books, and preparations for this are well in hand.

The Treasurer's Report is printed elsewhere and again affords matter for satisfaction. The *London Naturalist*, however, had again to be supported by subscriptions; it was an exceptionally good and worthy production, and it is to be hoped that every effort will be made to increase our membership and so bring nearer the time when this fund will be self-supporting while still maintaining or even surpassing our present level of publication.

A propaganda pamphlet was issued during the year, and this had the effect of bringing in several new members and, incidentally, was the means of having certain references to our Society printed in various suitable publications.

The Council hopes that members will continue to increase the number of records they send in to the Society, augment still further the attendances at meetings, and use every opportunity to secure yet more new members.

A. B. HORNBLOWER, *Honorary General Secretary.*

Librarians' Report, 1931.

THE librarians are pleased to report that 40 members have, during the year, borrowed 223 books, manuscripts, etc., compared with 211 in 1930. From this it will be seen that members are still making good use of the Library.

The number of books issued comprises 59 volumes on General Natural History, 55 on Ornithology, and 43 dealing with Entomology; 26 copies of various Proceedings and Reports were borrowed, and also 18 books on Botany and 16 dealing with Archaeology, the numbers for other sections declining, until we find that only 3 books were issued on Biography, 2 on Biology, and a single volume on Geology.

Since the last Report, about 90 books, manuscripts, and other publications have been received. Of these, an increasing number consists of Reports and Transactions of kindred Societies, received in exchange for the *London Naturalist*.

Many valuable donations to the Library have also been made, including the following:—

The Manuscript of the Bacot Memorial Lecture, entitled: "Plague, A Study in Medicine and Natural History," by Dr P. A. Buxton, M.A.

A series of ten papers on "Rare or Little-known Limicolae," by J. E. Harting, F.L.S., F.Z.S., reprinted from the *Proceedings of the Zoological Society of London* and from the *Ibis*, presented by Miss E. M. Harting.

"The Butterflies and Moths of New Zealand," by G. V. Hudson, presented by Miss A. R. Baily.

"The Ecology of the Grey Squirrel in the British Isles," by A. D. Middleton (1930), and "The Grey Squirrel," by A. D. Middleton (1931), both presented by the Author.

"A Naturalist on Lake Victoria," by G. D. Hale Carpenter, presented by J. A. Simes, O.B.E.

"Notes by a Naturalist on H.M.S. Challenger," by H. N. Moseley, presented by A. Capleton.

A great many loose parts of various journals and periodicals have been gradually accumulating since the war. We are pleased to report that this year, the Council made a grant for the purpose of getting some of these bound, thus making them more accessible to members. With this grant we have had the following eleven books bound and placed on the shelves:—*Antiquity* (2 vols.), *Entomologists' Monthly Magazine* (2 vols.), *Essex Naturalist* (2 vols.), *South Eastern Naturalist* (2 vols.), and one volume each of the *Entomologist*, *Scottish Naturalist*, *Vasculum*.

In conclusion, we wish to add that a new catalogue is in course of preparation.

ROBT. W. PETHEN and EDWARD MANN, *Hon. Librarians*.

LONDON NATURALIST ACCOUNT.

Donations,	£34 15 0	Printing London Naturalist,	£69 11 4
Advertisement,	1 1 0		
Sales of London Naturalist,	2 1 11		
Reprints and Maps,	2 0 11		
Transfer from General Account,	9 12 6		
Transfer from Reserve Account,	20 0 0		
	£69 11 4		£69 11 4

Note.—The sum of £17 7s 0d, received in November 1931, representing the cost of one paper, has not been included in the above.

STATEMENT OF ACCOUNTS.

LIFE COMPOSITION ACCOUNT.

Balance, 1st November 1930,	£75 0 0	Balance, 5 per cent 1929/47 War Stock, 31st October 1931,	£75 0 0
	£75 0 0		£75 0 0

RESERVE ACCOUNT.

Balance, 1st November 1930,	£50 0 0	To London Naturalist Account,	£20 0 0
	£50 0 0	Balance at Post Office, 31st October 1931,	30 0 0
			£50 0 0

Audited and found correct, 26th November 1931.

LEWIS EYNON,
C. L. COLLENETTE, *Auditors.*

F. G. DELL,
Treasurer.

Archæological Section.

REPORT FOR 1931.

THE Section has made eleven excursions, on which seven mediæval churches were visited, also the Geffrye Museum, Dulwich Chapel and Picture Gallery, Keston prehistoric camp, St Katherine's Hospital, and the Victoria and Albert Museum.

A notable feature of this year's outings has been the amount of assistance we have received from the clergy whose churches we have visited. When Mr Dallas led us to Dulwich, the Chaplain, Mr W. R. P. Crabbe, gave us a most interesting account of the College and Chapel, and took us over his house, which was built at the same time as the Chapel, 1619. Mr Pemberton, the Rector of Ingatestone, supplemented the remarks of our leader, Mr Stanley, when we visited that church, and gave us some very interesting first-hand information about it. Mr Browne, the Vicar of Erith, gave us a very well informed lecture about his church, and a good deal of information that we should not otherwise have had. One of our most successful outings was to Keston. Mr Cocksedge, our leader, had obtained permission to visit the camp in Holwood Park from Lord Stanley, M.P., who had very kindly had the bracken cut so that the earthworks might be more easily seen. At the Geffrye Museum we were shown round by the Curator, Mr Hawking, who gave a detailed account of many of the exhibits.

Two Record visits were made during the year, to Shere and Chipping Ongar. Both Records are exceptionally full and detailed. The Ongar one contains a series of views taken specially for it by Mr E. Yates. The attendance at the excursions has, in most cases, been good, the average being twelve.

There have been three Sectional Meetings. On 17th February Mr Walter Johnson gave an account of the Churchyard Yew. This was specially interesting as Mr Johnson is a recognised authority on the subject and has written about it. On 16th June Mr Forster showed some views of the French churches he had visited. These views consisted of an equal number of lantern slides and picture postcards shown on the epidiascope, Mr Forster's object being to contrast the two kinds of pictures; although the postcards came out very well, there was no doubt but that the lantern slides brought out the details of the pictures much more clearly. On 10th November Mr R. F. Andras gave a lecture on the Romanesque Churches of S. Italy. He had visited most of the churches and his views were well selected. His lecture was interesting, partly because many of the churches were off the beaten track and not well known to the average tourist.

The Section now numbers sixty-four, about the same as last year.

There have been no changes in the officers of the Section.

W. C. FORSTER, *Honorary Secretary.*

Botanical Section.

REPORT FOR 1931.

DURING the year the Section has provided a number of excursions, several of which have, in accordance with the Section's custom, been arranged with a view to seeing special plants *in situ*. In March the Daffodil, *Narcissus Pseudo-Narcissus* L., was seen in fair numbers near Broxbourne in a place which is fortunately very carefully protected by the owner of the property.

The Cornish Bladderseed, *Danaa cornubiensis* Burnat, was the object of a special excursion to its strangely isolated station in Buckinghamshire. The Section has also visited the Royal Horticultural Society's Gardens at Wisley, Surrey, and by courtesy of Mr W. B. Cranfield his delightful garden at Enfield. Two visits to Kew Gardens, two to Epping Forest, and one to Hampton Court have been arranged. A special excursion to Reigate in the hope of finding the locality given in Brewer's *Flora of Surrey* (1863) for *Colchicum* was unrewarded, but a large number of Orchids and other plants were seen in the same district on an earlier visit. Unfortunately, wet weather marred the enjoyment of some of the meetings.

At an ordinary meeting of the Section at the Society's headquarters a lecture of an unusual nature on Perfumes and Volatile Oils was given by our member, Mr G. R. A. Short. The lecture was admirably illustrated by a number of specimens of the various essences and oils, the efficacy of which those present were able to test for themselves.

Six new members have been enrolled during the year and the membership of the Section now stands at 99. The Committee hope that the membership will exceed 100 before the end of the coming year.

During the year many hundreds of sheets in the Herbarium have been overhauled and examined. The average condition of the specimens may be described as good, though individual sheets have required a careful dusting. In one or two cases, notably of large or succulent-leaved examples, these had shrivelled and powdered to such an extent that no useful purpose was served in retaining them in the collection. It is intended to continue this policy and later to check through the index-list and bring this up to date where necessary. Recent additions have been :—

Himantoglossum hircinum Sprgl. (*Orchis hircina* Crantz) and *Senecio sarracenicus* L., presented by Mr Burkill.

Ready accessibility to the Herbaria has induced an increased interest in these valuable adjuncts to the Society's activities, and requests have been made from time to time by new members for information, identification, etc., in which the Herbarium has proved of direct use and inspiration.

The Recorder reports that a good many lists of plants observed in the Society's District have been sent in, and have filled a considerable number of gaps in the divisional records. One plant is new to the whole area—*Euphrasia stricta* Host; this and some other records of interest are noted elsewhere (p. 97). Some of the Rubi mentioned by Mr W. Watson in his "Brambles of Kent and Surrey" are also new to our records.

Although some divisions, *e.g.*, Wimbledon (No. 14) and Westerham (No. 24) are still lacking in records of some common species, the records as a whole, comprising probably about 25,000 individual entries, must be considered as giving a fair picture of the flora of the London area within twenty miles of St Paul's, both as regards distribution and frequency. The need now is for a more widespread examination and recording of the critical genera, *Ranunculus*, *Fumaria*, *Rubus*, *Rosa*, *Euphrasia*, *Potamogeton*, and if you will, *Centaurea*, *Taraxacum*, *Hieracium*, etc.

It is intended to proceed with the publication of the Records as a supplement to the *London Naturalist*, and it is hoped that they may appear regularly henceforth until completion.

HERMAN SPOONER, *Chairman*.

BERNARD T. WARD, *Honorary Secretary*.

Entomological Section.

REPORT FOR 1931.

FOUR sectional meetings have been held. On 17th March Mrs K. Grant read a paper on Aquatic Hymenoptera; on 19th May Mr W. J. Kaye lectured on the Entomology and Botany of Costa Rica, and on 15th December Mr E. A. Aris read a paper on his experiences while collecting in France and Germany and on the shores of the Adriatic. The 27th October was devoted to the Annual General Meeting of the Section. The average attendance has shown a welcome improvement, having risen from 9.33 in 1929 and 1930 to 24.25 in 1931.

Five outings have been carried out, the places visited being Coulsdon, Clandon, Limpsfield, Dorking and Epping. The larva hunt on 12th September at Epping was spoilt by persistent rain, but on the other occasions the species scheduled for observation were duly seen and noted. The average attendance was adversely affected by the weather and only reached 4.25. The outing to Bricket Wood was abandoned owing to unfavourable conditions.

The appearance in the first half of the year of several species of butterflies led to the impression that we were to have a good season, but the weather upset this and the results have been generally unsatisfactory.

A number of members have again communicated their experiences during the year among the macro-lepidoptera, and a summary of these appears elsewhere in this volume.

Some work has been done on other orders of insects, and Mr Benson has continued his studies of Sawflies, and it is hoped to be able to publish some of his records. We should be glad if other members will submit to him any of these insects that they may come across from time to time.

The Curator, Mr E. A. Aris, would be glad to receive offers of some British butterflies, including *P. machaon*, *A. iris*, *L. sinapis*, etc., to replace worn specimens and so complete the series in the collection.

H. J. BURKILL, *Honorary Secretary*.

Ornithological Section.

REPORT FOR 1931.

GENERAL.

THREE Sectional Meetings were held at Headquarters during the year, when the following papers were read to the Section:—17th February, “Herons and other Birds,” by Mr H. N. Southern; 19th May, “Romney Marsh and its Birds,” by Dr H. Lambert Lack; 20th October, “Some Structural Observations on the Waders (Scolopacidae) and their bearing on the Classification of the Family,” by Dr G. Carmichael Low.

On 15th February, a visit was paid to Tring Museum, when Dr Jordan kindly arranged a comprehensive exhibition of skins showing the British Warblers.

It is with much regret that the Committee accept the resignation of Messrs L. Parmenter and R. W. Pethen from their respective offices of Recorder and Reading Circles Secretary. Mr Parmenter has acted as a Recorder for the past three years and both the Section and the Society owe him a debt for his invaluable work in this department. As Reading Circles Secretary, Mr Pethen has shown untiring energy. In his capable hands the circles have increased to seven during his term of office. We offer both gentlemen our sincere thanks for their help.

After many years' service as Ornithological Curator our old and valued member, Mr P. J. Hanson, is also compelled to relinquish his office. He was responsible for starting the present collection of photographs and in his hands the collection of skins took its present form. We warmly thank him for his work in the past. Mr Littlejohn kindly agreed to succeed Mr Hanson as Curator.

At the beginning of the year two members of the Section, Messrs Harrisson and Hollom, inaugurated a scheme for investigating the migratory habits of the Great Crested Grebe. The Committee decided to associate the Section with this work, and elected a Sub-Committee with Mr C. S. Bayne as Secretary. A circular letter was drawn up and

issued to all members of the Section inviting their co-operation. It is hoped to make an announcement of the result in our next report.

The membership of the Section continues to advance, 37 new members having joined during the year, and deducting 10 resignations the membership on the 31st December was 197.

The thanks of the Section are due to those members and correspondents who have kindly made donations to the collections and furnished records and notes during the year. In particular, the Committee have to acknowledge with grateful thanks, the gift of a collection of interesting ornithological manuscripts, pamphlets, etc., presented by Miss E. M. Harting, daughter of the well-known ornithologist, J. E. Harting.

FIELD MEETINGS.

The popularity of the Field Meetings was maintained, 78 different members and 34 visitors attending one or more of the 30 meetings, the average attendance being 13.9.

118 different species were identified (average 42.4), including Jack Snipe, Black-necked Grebe, Water Rail, Red-breasted Merganser, Hooded Crow, Grey Plover and Black Tern.

Twelve sub-districts of the Society's area were visited in the course of the following Field Meetings:—Cobham, Kent Marshes, Stanmore, Tring, Essex Marshes, Walthamstow Reservoirs, Sevenoaks, Hatfield-Hyde, Limpsfield, Box Hill, Chorley Wood, Wanstead Park, Hackhurst Downs, Effingham, Bookham, Curtismill Green, Richmond Park, Kent Woodlands, Brentwood, Chess Valley, Hatfield, Epping Forest, Caterham and Headley.

RINGING.

The Society's returns under the *British Birds* marking scheme for the year totalled 562 birds of 35 species. At the special request of the editor of *British Birds*, fewer nestlings of the small birds are being ringed and some of our ringers have been trapping and ringing adults. It is encouraging to note that no fewer than 313 birds of the total number were ringed as adults and the work of Messrs C. L. Collenette and Stuart Boardman contributed largely to this result. Seven ringers took part in the work and we welcome an additional ringer, Mr W. D. Northway. A list of the birds recovered is printed elsewhere (p. 79).

READING CIRCLES.

There have been some gains and losses during the year among subscribers to our *British Birds* Reading Circles, the nett result being the same as last year, viz., seven copies circulating among 51 members. The *Scottish Naturalist* continues to be circulated to 12 members, thanks to the kindness of Miss M. G. L. Best. New members wishing to subscribe should communicate with the Secretary of the Reading Circle. A substantial addition to the funds of the Section has been made by the sale of unbound volumes of *British Birds*, and members are invited to apply for those still on hand.

COLLECTIONS.

Twenty-three photographs have been added to the collection during the year, making a total of 219 sheets. There have been no additions to the skin or egg collections.

S. AUSTIN, *Chairman*.

D. H. CLANCHY, *Honorary Secretary*.

Plant Galls Section.

REPORT FOR 1931.

FIVE meetings have been held during the year, at four of which papers were read and specimens exhibited, while the other evening was devoted to the Annual General Meeting of the Section.

At the Annual Exhibition on 26th January a number of galls were shown by members, amongst which was Mr K. G. Blair's case of galls on *Phragmites communis* Trin., together with the insects found in them.

Seven outings have been successfully undertaken, the places visited being Bookham Common, 30th May; Coldharbour, 6th June; Burnham Beeches, 18th July; Banstead and Epsom Downs, 8th August; Lessness Abbey Wood, 5th September; Epping, 12th September; and Claygate, 19th September.

A large number of observations have been made, some of which are given in the list printed elsewhere in this volume (p. 93).

H. J. BURKILL, *Honorary Secretary*.

Ramblers' Section.

REPORT FOR 1931.

FOURTEEN Rambles have been held; attendance at these has varied between 2 and 15, the average being 7, which is a slight decrease from that of last year.

These rambles have been by field-paths and by-ways to quiet and little-known corners of each of the home counties, and have included an all-night ramble to Leith Hill and Holmbury, and a visit to the Chess Valley Trout Farm at Chorley Wood.

Though no records are kept, many things of interest have been seen on these excursions which have given pleasure to several who are not specialists in any particular branch of natural history.

In addition, three meetings have been held at Headquarters, when the following lantern lectures were given:—"The Pilgrims' Way," by Mr A. L. Simpson (Assistant Secretary to the Commons, Open Spaces, and Footpaths Preservation Society), an extremely interesting lecture on the ancient trackway along the North Downs from Winchester to Canterbury, illustrated with a fine lot of slides from photographs by the lecturer and followed by a discussion on the work of his society; "Peasant Life in Alpine Districts," by Mr J. E. S. Dallas, also illustrated with the lecturer's own slides; and "Notes on Trees," by Mr B. T. Ward.

The Section continues to be affiliated to the Federation of Rambling Clubs.

E. L. KING, *Honorary Secretary.*

Chingford Branch.

REPORT FOR 1931.

THE year 1931 was the 21st anniversary of the formation of the Chingford Branch, which was founded in April 1910. A special Anniversary meeting was held on 13th April 1931 to celebrate this event. The lecturer was Mr C. L. Collenette, F.E.S., and his subject, "A Naturalist's Visit to British Somaliland," and many old members and officials of the Branch supported him.

The Branch Associateship has not suffered any great alteration in numbers during the year, and the attendance at the meetings was good throughout the session with the exception of the Exhibition held in January, which was poorly attended.

The following lectures were given at the meetings other than those mentioned above:—"Saxon Work in Our Churches," J. E. S. Dallas; "Corals and Sea Urchins and their Allies," J. F. Hayward; "Nesting Habits of some Familiar Birds," E. B. Pinniger; "Primitive Man in East Anglia," J. F. Hayward and Rev. H. J. Gamble, M.A.; "Some Notes on Trees," B. T. Ward; "Maritime Plant Communities," R. Melville, B.Sc.

One excursion was arranged, but the weather made it impossible to carry this out.

JOHN F. HAYWARD, *Local Secretary.*

List of Members.

(Corrected up to 27th May 1932.)

It is particularly requested that Members will inform the Secretary as soon as possible of any change of address.

Honorary President:

THE RIGHT HON. THE VISCOUNT GREY OF FALLODON, K.G., P.C.

Honorary Vice-Presidents:

SIR LAURENCE CHUBB. PROF. M. GREENWOOD, D.Sc., F.R.S., F.R.C.P.
F. J. HANBURY, F.L.S., F.E.S. L. B. PROUT, F.E.S. J. ROSS.

Honorary Members:

- 1894 Burrows, Rev. C. R. N., F.E.S., The Vicarage, Mucking, Stanford-le-Hope, Essex. (Lep.)
1927 Le Souef, A. S., C.M.Z.S., R.A.O.U., Taronoga Zoological Park Trust, Sydney, Australia.
1899 Massey, Herbert, M.B.O.U., F.E.S., Ivy Lea, Burnage, Didsbury, Manchester. (Lep., Orn., Ool.)

Members:

- 1929 Ackland, Miss C. M., M.B.O.U., Walwood, Banstead, Surrey. (Orn.)
1892 Adkin, R., F.E.S., Hodeslea, Meads, Eastbourne. (Lep.)
1929 Aldis, Miss J. B. W., 68 Longton Grove, West Hill, Sydenham, S.E.26. (Orn., R.)
1925 Aldred, Miss B. A., 16 Boscastle Road, Dartmouth Park, Kentish Town, N.W.5.
1927 Aldred, Miss K. V., 5 Ladbroke Court, Ladbroke Gardens, Notting Hill, W.11. (Arch., Orn.)
1922 Aldred, Miss M., Flat 5, 21 Ladbroke Gardens, Notting Hill, W.11. (Orn.)
1928 Alexander, O. A., 23 New Cavendish Street, W.1. (Ent.)
1932 Angell, Miss K. W., at 68 Broxholm Road, West Norwood, S.E.27. (Orn., Ent., R.)
1932 Arbon, Mrs J. A., Brookside, Eversley Park Road, Winchmore Hill, N.21. (Arch.)
1925 Archbould, R. S., Forest Way, Loughton, Essex. (Orn.)
1915 Aris, E. A., F.Z.S., 9 Oak Avenue, Priory Road, Hornsey, N.8. (Lep.)
1931 Aris, Kenneth A., 9 Oak Avenue, Priory Road, Hornsey, N.8. (Ent., Orn.)
1932 Arnold, Miss W., 43 The Quadrant, Wimbledon, S.W. 19. (Orn.)
1892 Austin, S., F.Z.S., 43 Darenth Road, Stamford Hill, N.16. (Orn., Arch., R.)

- 1931 Axford, W. G., Surgeon Rear Admiral, C.B., F.L.S., 27 St George's Mansions, Red Lion Square, W.C.1. (Bot.)
- 1931 Back, Dr Marjorie, 23 Seymour Road, Hampton Wick, Surrey. (Bot., Orn.)
- 1929 Baggallay, Miss J., 11 Ridgway Place, Wimbledon, S.W.19. (Orn.).
- 1929 *Bagnall, R. S., D.Sc., F.R.S.E., 9 York Place, Edinburgh. (Plant Galls, Ent., Bot.)
- 1927 Baily, Miss A. R., Cressex Lodge, Binfield, Berks. (Arch., Bot., Orn., Ent., Plant Galls, R.)
- 1924 *Baker, Edward C. S., J.P., O.B.E., F.Z.S., F.L.S., M.B.O.U., H.F.A.O.U., 6 Harold Road, Upper Norwood, S.E.19. (Orn.)
- 1927 Barclay-Smith, Miss P., F.Z.S., M.B.O.U., Park Lodge, Hervey Road, Blackheath, S.E.3. (Orn.)
- 1927 Barr, Mrs Margaret, 50 Penywern Road, Earls Court, S.W.5. (Orn., Bot.)
- 1931 Barrett, Miss E., 6 Frognal Mansions, Hampstead, N.W.3. (Arch.)
- 1930 Barton, Wm. C., 43 Rosary Gardens, S. Kensington, S.W.7. (Bot.)
- 1903 *Battley, Mrs, 21 Creswick Road, West Acton, W.3.
- 1932 Bayliss, C. V., 14 Conan Mansions, West Kensington, W.14. (Arch.)
- 1915 Bayne, Charles S., 92 Fleet Street, E.C.4. (Orn.)
- 1930 Beatty, W. G., 7 St Mary Abbots Place, Kensington, W.8. (Orn., Arch.)
- 1931 Becker-Bingham, N. F., 141 Half-Moon Lane, Herne Hill, S.E.24. (Orn., Ent.)
- 1926 Benn, Miss A., 68 South Esk Road, Forest Gate, E.7. (Orn., Ent.)
- 1929 Benson, R. B., M.A., F.E.S., F.Z.S., British Museum (Natural History), South Kensington, S.W.7. (Bot., Orn., Ent., esp. Sawflies.)
- 1932 Bentham, C. H., Thursley, Kingswood Road, Tadworth, Surrey. (Orn.)
- 1927 Best, Miss M. G. L., F.Z.S., M.B.O.U., 28 Paulton's Square, Chelsea, S.W.3. (Orn.)
- 1920 Biddiscombe, W., 3 Broadway, Woking, Surrey. (Bot.)
- 1932 Binley, Miss E. M., 207 Grove Lane, Denmark Hill, S.E.5. (Orn.)
- 1896 Bishop, E. B., Lindfield, Marshall Road, Godalming, Surrey. (Bot., Arch., Plant Galls, Orn.)
- 1926 Blackett, Miss F., 196 Cromwell Road, Earls Court, S.W.5. (Orn.)
- 1932 Blackmore, A., 43 Tavistock Square, W.C.1. (Bot.)
- 1930 Blair, K. G., B.Sc., F.E.S., 120 Sunningfields Road, Hendon, N.W.4. (Ent.)
- 1926 Blezard, Miss R., F.Z.S., M.B.O.U., 117 Sloane Street, S.W.1. (Orn., Bot.)
- 1925 Boardman, Stuart, 45 Empress Avenue, Woodford Green, Essex. (Orn.)

- 1932 Braithwaite, Miss D. M., 18 Warren Road, Chingford, E.4. (Orn.)
- 1902 Braithwaite, J. O., 18 Warren Road, Chingford, E.4. (Micr., Bot., Ent.)
- 1910 Braithwaite, Miss N. A., 18 Warren Road, Chingford, E.4.
- 1929 Brants, Mrs J. C., The Sheiling, Jordans, nr. Beaconsfield, Bucks. (Orn.)
- 1929 Brearley, Miss B., 93 South End Close, Hampstead, N.W.3. (Orn., R., Bot., Arch., Ent.)
- 1930 Brend, Wm. A., M.A., M.D., B.Sc., 14 Bolingbroke Grove, Battersea, S.W.11. (Arch., Orn., R.)
- 1916 Brown, A., F.Z.S., 44 Ravensdale Road, Stamford Hill, N.16. (Orn., Arch., Geol., R.)
- 1932 Brown, Miss E. P., 19 Queensberry Place, S. Kensington, S.W.7. (Orn.)
- 1926 Browne, Miss Constance H., 219 Harlesden Road, Willesden, N.W.10. (R., Arch., Bot.)
- 1930 Burgham, Miss J. E., 7 Nevern Place, Earls Court, S.W.5. (Orn.)
- 1915 Burkill, H. J., M.A., F.R.G.S., 3 Newman's Court, Cornhill, E.C.3. (Plant Galls, Lep., Bot., Geol., Orn., R.)
- 1931 Button, H. S., F.Z.S., The Cedar House, Hillingdon, Middlesex.
- 1928 *Campbell, J. M. H., M.D., 47 Arkwright Road, Hampstead, N.W.3. (Orn., R.)
- 1912 Capleton, A., Beaufort House, 37 Lansdowne Road, S. Woodford, E.18. (Mam., Orn., R., Bot.)
- 1926 Carr, Miss A. N., 7 Cambridge Road, Watford, Herts. (Orn., R.)
- 1932 Castell, C. P., 52 Graham Road, Wimbledon, S.W.19. (Bot., Geol.)
- 1932 Champneys, Mrs M., Hall Oak, Frognal Lane, Hampstead, N.W.3. (Bot., Plant Galls, Ent.)
- 1930 Chandler, S. E., D.Sc., F.L.S., 59 Anerley Park, Penge, S.E.20. (Bot.)
- 1931 Chester, Geo., 71 Holmdene Avenue, Headstone Lane, Harrow, Middlesex. (Bot.)
- 1931 Chubb, Sir Laurence, 71 Eccleston Square, S.W.1. (R.)
- 1927 Clanchy, Mrs B. L., Russell Mansions, 21 Coram Street, W.C.1. (R., Orn.)
- 1927 Clanchy, D. H., Russell Mansions, 21 Coram Street, W.C.1. (R., Orn.)
- 1928 Clarke, H. T., The Yews, Godmersham, Canterbury, Kent.
- 1910 Clarke, J. W., Hazeldene, 21 The Ridgeway, Chingford, E.4. (Bot.)
- 1927 Coates, Mrs E. F. M., 5 King's Garth, London Road, Forest Hill, S.E.23. (Orn.)
- 1927 Coates, J. B., 5 King's Garth, London Road, Forest Hill, S.E.23. (Orn.)
- 1929 Coates, Miss N. H., Woodhouse, Beaumont Road, Wimbledon Park, S.W.19. (Orn., Bot.)
- 1904 Cockayne, E. A., M.A., D.M., F.R.C.P., F.E.S., 116 Westbourne Terrace, Paddington, W.2. (Lep., Biol.)

- 1925 Cocksedge, W. C., 6 Aldersmead Road, Beckenham, Kent. (Orn., Arch., Bot.)
- 1929 Cocksedge, Mrs, 6 Aldersmead Road, Beckenham, Kent. (Arch., Bot.)
- 1932 Collard, J. B., 120 St Julian's Farm Road, W. Norwood, S.E.27. (Orn.)
- 1907 Collenette, C. L., F.R.G.S., F.E.S., Ashburton Hotel, The Terrace, Richmond, Surrey. (Ent., Orn., Bot.)
- 1914 Connoll, Miss E., 98 Connaught Avenue, Chingford, E.4.
- 1904 Cooke, Rev. P. H., M.A., 19 Hainthorpe Road, West Norwood, S.E.27. (Bot., Arch.)
- 1928 Cox, Miss L. E., 72 Corringham Road, Golders Green, N.W.11. (Bot.)
- 1929 Cranfield, Mrs V., Little Tompsetts, Forest Row, Sussex. (Orn.,)
- 1930 Critchley, Miss R. D., 19 Clephane Road, Essex Road, N.1.
- 1931 Croal-Thomson, Miss I., 32 Cholmeley Park, Highgate, N.6. (Orn., R.)
- 1930 Crocker, Miss L. H., 23 Upper Westbourne Terrace, W.2. (Bot.)
- 1931 Crook, W. M., F.R.G.S., F.Z.S., 6 St Andrew's Place, Regent's Park, N.W.1. (Orn.)
- 1927 Cross-Rose, F., Kenmore, 20 Woolstone Road, Forest Hill, S.E.23. (Orn.)
- 1928 Cuningham, Miss D. W. M., 50 Ladbroke Grove, Notting Hill, W.11. (Orn., Ent., Plant Galls, Bot.)
- 1930 Cunningham, J., M.B.O.U., Fernhill, Belfast. (Orn.)
- 1892 Cyriax, R. C., 23 Aberdare Gardens, West Hampstead, N.W.6. (Arch., Aryan question, Indo-European languages.)
- 1920 Dallas, J. E. S., 83 Belsize Lane, Hampstead, N.W.3. (Orn., Bot., Arch.)
- 1925 Dallas, Mrs Rosa F., 83 Belsize Lane, Hampstead, N.W.3.
- 1922 Davis, E. J., M.I.Mech.E., Milestone, Church Hill, Loughton, Essex. (Orn.)
- 1930 Dayal, Har., M.A., Ph.D., 10 Churchill Road, Edgware, Middlesex. (Bot.)
- 1926 Deane, Miss M. B. H., The Berries, Gerrards Cross, Bucks. (Orn.)
- 1910 Dell, F. G., 55 Russell Road, Buckhurst Hill, Essex. (Pond Life, Micr., Orn.)
- 1932 Denham, R., M.B.O.U., 21a Well Walk, Hampstead, N.W.3. (Orn., Ent.)
- 1928 Douglas-Smith, Miss K., 19 Thurlow Road, Hampstead, N.W.3. (Arch., Orn., Bot.)
- 1927 Druce, F., M.A., F.L.S., 7 Culford Gardens, Chelsea, S.W.3. (Bot.)
- 1927 Dunkerley, Rev. C. L., Iver Heath Rectory, Iver, Bucks. (Arch., Orn.)
- 1928 Emberson, L. M., 49 Adela Avenue, West Barnes, New Malden, Surrey. (Orn.)

- 1927 English, Miss F., 8 Dorville Road, Ravenscourt Park, Hammer-smith, W.6. (Orn., Bot., Arch., R.)
- 1927 Evans, E. B., 86 Emmanuel Road, Balham, S.W.12. (Orn.)
- 1907 Eynon, Lewis, B.Sc., F.I.C., Fernleigh, Hall Lane, Upminster, Essex. (Chem.)
- 1925 Farish, Mrs, Corner House, 42 London Lane, Bromley, Kent.
- 1929 Finch, F. R., 9 Cheyne Row, Chelsea, S.W.3. (Orn.)
- 1927 Fisher, Mrs G. L., 80 Richmond Avenue, Hillingdon, Middlesex. (Arch.)
- 1930 Fitch, Miss V., 97 Longton Avenue, Sydenham, S.E.26. (R.)
- 1927 Ford, H. E., 30 The Common, Upper Clapton, E.5. (Orn.)
- 1922 Forster, W. C., 40 Nevern Square, Earls Court, S.W.5. (Arch., R.)
- 1924 Foster, John B., B.A., Aldwick, Holland Road, Sutton, Surrey. (Orn.)
- 1928 Fox, G. J. B., 45 Stanwick Mansions, West Kensington, W.14. (Arch.)
- 1932 Franklin, A. W. L., 16 Airlie Gardens, Campden Hill, W.8. (Orn.)
- 1931 Frederick, Miss L. M., Avery Hill Training College, Eltham, S.E.9. (Orn., Pond Life.)
- 1931 Frohawk, F. W., M.B.O.U., F.E.S., Essendene, Cavendish Road, Sutton, Surrey. (Orn., Ent.)
- 1931 Furneaux, Miss S., 15 Christchurch Road, Dartford, Kent. (Orn., Bot.)
- 1920 Gamble, Rev. H. J., M.A., 14 Frederica Road, Chingford, E.4. (Arch., Conch.)
- 1932 Garrido, A. S., 102 Clonmell Road, Tottenham, N.17. (Bot.)
- 1928 Gauntlett, H. L., F.Z.S., F.E.S., F.R.M.S., F.R.H.S., 37 Howard's Lane, Putney, S.W.15. (Orn., Bot., Ent.)
- 1910 Gaze, W. E., 10 The Avenue, Highams Park, Chingford, E.4. (Lep., Bot., Chem.)
- 1909 Gerrard, V. L. G., Dunster House, Mincing Lane, E.C.3. (Lep.)
- 1931 Gillett, J. D., 1 Beulah Road, Walthamstow, E.17. (Ent., Rept.)
- 1910 Glegg, W. E., F.Z.S., M.B.O.U., The House, Albion Brewery, Whitechapel Road, E.1. (Orn.)
- 1910 Glegg, Mrs, The House, Albion Brewery, Whitechapel Road, E.1. (Orn., Arch.)
- 1929 Goodfellow, Miss L., Flat 3, 28 John Street, Gray's Inn, W.C.1. (Orn.)
- 1929 Goodwin, J. L., Gradwell, Monkham's Drive, Woodford Green, Essex. (Ent., Orn.)
- 1930 Goodwin-Vanner, R. E., F.R.H.S., F.R.C.I., Essex Villa, Guildford, Surrey. (Arch.)
- 1927 Green, Roland, F.Z.S., Ruskin Studio, 7 New Court, Lincoln's Inn, W.C.2. (Orn.)
- 1931 Greenwood, F. D., Farm Lodge, Edenbridge, Kent. (Lep.)
- 1899 *Greenwood, Prof. M., D.Sc., F.R.S., F.R.C.P., Hillcrest, Church Hill, Loughton, Essex. (Arch., Biol.)

- 1931 Grey, Mrs O., 90 Charing Cross Road, W.C.2. (Arch., Bot., Ent., Orn., Plant Galls, R.)
- 1928 Griffin, Miss M., 22 Addison Way, Golders Green, N.W.11. (Orn.)
- 1920 Grinling, C. H., B.A., 71 Rectory Place, Woolwich, S.E.18. (Bot.)
- 1931 Gross, S., 53 Hanover Gate Mansions, N.W.1. (Orn.)
- 1929 Gulliver, Miss M. D., 84 Endsleigh Gardens, Ilford, Essex. (Orn.)
- 1927 Hale, R. W., 35 Christchurch Avenue, Kilburn, N.W.6. (Orn.)
- 1903 Hanbury, F. Capel, Westfield, Hoddesdon, Herts. (Lep.)
- 1906 Hanbury, Frederick J., F.L.S., F.E.S., Brockhurst, East Grinstead, Sussex. (Bot., Lep.)
- 1897 *Hanson, P. J., Burcroft, Village Road, Bush Hill Park, Enfield, Middlesex. (Orn., Arch.)
- 1927 Hardiman, Miss A., 1 Avenue Mansions, Park Avenue, Willesden Green, N.W.2. (R.)
- 1921 Hardiman, J. P., C.B.E., B.A., 1 Avenue Mansions, Park Avenue, Willesden Green, N.W.2. (Orn., R.)
- 1931 Hartley, P. H. T., 29 Christchurch Park, Sutton, Surrey. (Orn.)
- 1927 Harvey, J. H., Dallinga, Lower Road, Great Bookham, Surrey. (Bot.)
- 1930 Haworth, Miss F. M., B.Sc., F.Z.S., 13 Theobalds Road, W.C.1. (Zoo., Bot.)
- 1931 Hay, Mrs M., 38 Nella Road, Hammersmith, W.6. (Bot., Orn.)
- 1927 Hayward, Jno. F., 17 Heathcote Grove, Chingford, E.4. (Geol., Zoo.)
- 1929 Hazlewood, A., 5 Marksbury Avenue, Richmond, Surrey. (Orn.)
- 1932 Hearn, Miss O. T. G., 56 Meadvale Road, Ealing, W.5. (Orn., Bot.)
- 1902 Heath, G. H., M.A., 7 E. St Philip's Road, Surbiton, Surrey. (Lep.)
- 1930 Hick, A. E., 68 Brockwood Lane, Welwyn Garden City, Herts.
- 1929 Hicks, John B., F.E.S., 30 Stanhope Gardens, South Kensington, S.W.7. (Ent.)
- 1932 Higgins, T. T., F.R.C.S., 34 Harley Street, W.1. (Orn.)
- 1931 Hine, Mrs S. McDougall, Chalklands, Hempstead, nr. Chatham, Kent. (Orn.)
- 1929 Hollom, P. A. D., Birchfield, Addlestone, Surrey. (Orn.)
- 1930 Hopkins, Graham, 5 Purley Bury Avenue, Purley, Surrey. (Orn.)
- 1919 Horn, P. W., Stepney Borough Museum, 77 Whitechapel High Street, E.1. (Orn., Aqua.)
- 1905 Hornblower, A. B., 91 Queen's Road, Buckhurst Hill, Essex. (Api., Arch., Orn., R.)
- 1931 Hose, Miss M. M., 22 The Avenue, Bickley, Kent. (Orn., Bot., Ent., Plant Galls.)
- 1910 Howard, D. Lloyd, J.P., F.I.C., F.C.S., Pettits Hall, Chigwell, Essex. (Chem.)
- 1927 Hussey, H. J., 416 High Road, Leyton, E.10. (Arch., Orn., R.)
- 1930 Hutton, Miss R. E., 13 Theobalds Road, W.C.1. (Bot., Zoo.)
- 1927 Impey, Mrs L. A., Great Rollright Manor, Chipping Norton, Oxon. (Orn.)

- 1927 Jago, R. P., F.Z.S., Rookwood, Bridle Road, Eastcote, Middlesex. (Orn.)
- 1932 James, Mrs R. E., 33 Headstone Road, Harrow-on-the-Hill, Middlesex. (Ent., Arch.)
- 1927 Jeffery, H. J., A.R.C.Sc., F.L.S., 14 Coppetts Road, Muswell Hill, N.10. (Bot.)
- 1926 Jehan, Kenneth C., 61 High Street, Amersham, Bucks. (Bot., Arch.)
- 1929 Johns, Miss F. E., 40 The Ridgeway, Kenton, Harrow, Middlesex. (Orn., R., Bot.)
- 1931 Johnston, F. J., St Denys, Connaught Avenue, Chingford, E.4. (Orn.)
- 1932 Jones, Rodney R. M., Tros-yr-Afon, Penmon, Anglesey. (Orn.)
- 1899 *Kaye, W. J., F.E.S., Caracas, Ditton Hill, Surbiton, Surrey. (Lep.)
- 1931 Kent, Mrs J. Barton, 2a Grove End House, St John's Wood Road, N.W.8. (Arch.)
- 1930 King, Miss C. A., 152 Harley Street, W.1. (Orn., Arch.)
- 1929 King, E. L., 34 Wallorton Gardens, East Sheen, S.W.14. (Orn., Bot., R.)
- 1928 Kingsbury, A. W. G., 24 Bina Gardens, Earls Court, S.W.5. (Orn., Ent.)
- 1929 Kitto, Mrs N. C., Rothesay, Tomsford Road, St Albans, Herts. (Orn.)
- 1931 Lack, C., 31 Marlborough Place, St John's Wood, N.W.8. (Orn.)
- 1928 Lack, D. L., M.B.O.U., 31 Marlborough Place, St John's Wood, N.W.8. (Orn.)
- 1928 Lack, H. L., M.D., F.R.C.S., 31 Marlborough Place, St John's Wood, N.W.8. (Orn.)
- 1929 Lamb, Mrs K. E., Mildura Cottage, Lymington, Hants. (Orn.)
- 1927 Lane, J. H., 571/3 Commercial Road, E.1. (Chem.)
- 1932 Le Cocq, L., 17 Highbury Hill, N.5. (R., Orn.)
- 1930 Ledlie, R. C. B., M.B., B.Sc., F.R.C.S., 23 Beaumont Street, W.1. (Bot.)
- 1928 Lee, Miss M., 22 Addison Way, Golder's Green, N.W.11. (Orn.)
- 1928 Leech, T., 33 First Avenue, Bush Hill Park, Enfield, Middlesex. (Bot., Orn.)
- 1929 Leigh, Kenneth, 24 Queen's Road, Beckenham, Kent. (Orn.)
- 1922 Lemon, Mrs M. L., M.B.E., J.P., M.B.O.U., F.Z.S., Hillcrest, Redhill, Surrey. (Orn.)
- 1919 Leyton Public Libraries, per the Librarian (E. Sydney, F.L.A.). Central Library, Leyton, E.10.
- 1927 Lister, Miss G., F.L.S., 871 High Road, Leytonstone, E.11. (Orn.)
- 1926 *Littlejohn, H. A., 93 Carlyle Road, Manor Park, E.12. (Orn., Bot.)
- 1926 Longfield, Miss C. E., F.R.G.S., F.E.S., M.B.O.U., F.Z.S., 20 Pont Street, S.W.1. (Orn., Ent., Bot.)

- 1930 *Low, G. Carmichael, M.A., M.D., F.R.C.P., F.Z.S., M.B.O.U.,
86 Brook Street, Grosvenor Square, W.1. (Orn., Zoo.)
- 1919 Lowne, B. T., Ravenscroft, 129 Bromley Road, Catford, S.E.6.
(Bot.)
- 1931 McDowall, R., 105 Abingdon Road, Kensington, W.8.
- 1911 MacIntosh, Miss I. S., 3 Mayfield Road, Chingford, E.4. (Bot.)
- 1911 MacIntosh, Miss J. D., 3 Mayfield Road, Chingford, E.4.
- 1929 Mackay, Helen M. M., M.D., 28 John Street, Bedford Row, W.C.1.
(Orn.)
- 1931 McKittrick, Thos. H., Jun., M.B.O.U., 28 Chelsea Park Gardens,
S.W.3. (Orn.)
- 1931 McLuckie, Miss J. E., 14 Oakeshotte Avenue, Holly Lodge Gar-
dens, Highgate, N.6. (Orn., Bot.)
- 1923 *Macpherson, A. Holte, F.Z.S., 21 Campden Hill Square, W.8.
(Orn.)
- 1932 Macqueen, Miss R. W. E., 252 Camden Road, N.W.1. (Arch.,
Orn., R.)
- 1929 Maltby, Miss J., Dunchiffe, 157 Copers Cope Road, Beckenham,
Kent. (Orn., Bot., Pond Life.)
- 1923 Mann, Edward, 10 Frankland Road, S. Chingford, E.4. (Pond
Life, Orn.)
- 1932 Marshall, Major H. S., 6 Sloane Gardens, S.W.1. (Orn.)
- 1929 Marshall, John G., Rye House, Green Lane, New Eltham, S.E.9.
(Orn.)
- 1929 Martin-Hurst, Miss B., The End House, Roehampton, S.W.15.
(Orn.)
- 1931 Maud, F., 19 Belsize Park Gardens, S. Hampstead, N.W.3.
(Arch.)
- 1931 Maud, Mrs F., 19 Belsize Park Gardens, S. Hampstead, N.W.3.
(Arch.)
- 1927 Mellows, C., M.A., F.E.S., School House, Bishops Stortford Col-
lege, Herts. (Bot., Ent.)
- 1931 Millburn, Miss F. C., 62 Herne Hill, S.E.24. (Orn.)
- 1926 Mitchell, Miss E. A., 6 The Uplands, Ruislip Manor, Middlesex.
(Bot.)
- 1932 Mitchell, Miss M. I., 38 Queen's Road, Bayswater, W.2. (Bot.,
Orn.)
- 1928 Murphy, Miss H., 43 Stafford Row, Bow, E.3. (Bot., Orn., Ent.,
Arch.)
- 1926 Niblett, Montague, 10 Greenway, Wallington, Surrey. (Ent.,
Plant Galls.)
- 1893 *Nicholson, Miss B., Rotherwood, 49 Danecourt Road, Parkstone,
Dorset. (Bot.)
- 1932 Nicholson, G., Homeland, Basildon Road, Laindon, Essex. (Orn.)
- 1928 Noel, Miss E. F., 37 Burnham Court, W.2. (Bot., Orn., R.)
- 1925 Norman, Cecil, F.L.S., 55 Eccleston Square, S.W.1. (Bot., Orn.)
- 1931 Northway, W. D., 419 Hale End Road, Woodford Green, Essex.
(Orn., Ent.)

- 1926 *Oldham, Charles, F.L.S., F.Z.S., M.B.O.U., The Bollin, Shrublands Road, Berkhamsted, Herts. (Bot., Orn., Conch.)
- 1931 Overton, Mrs W., 44 Warren Road, Chingford, E.4. (Orn., Bot.)
- 1929 Page, Miss M. M., 19 Hainthorpe Road, West Norwood, S.E.27. (Orn.)
- 1924 Palmer, Miss Fanny, 8 Ulundi Road, Blackheath, S.E.3. (Arch.)
- 1928 Palmer, R., F.E.S., F.Z.S., Standeford, Baldock Road, Letchworth, Herts. (Ent., Orn., Plant Galls, Pond Life, R.)
- 1925 *Parmenter, L., 94 Fairlands Avenue, Thornton Heath, Surrey. (Orn.)
- 1921 Parsons, S. T. T., 33 Trebovir Road, Earls Court, S.W.5. (Orn.)
- 1922 Payne, C. H., 13 Kidderpore Gardens, Hampstead, N.W.3. (Orn., Arch.)
- 1930 Payne, E. D. B., 9 Oaktree Avenue, Palmer's Green, N.13. (Orn.)
- 1923 Payne, E. M., Tilgate, Long Lane, Hillingdon, Middlesex. (Bot., Orn.)
- 1923 Payne, L. G., 22 Marksbury Avenue, Richmond, Surrey. (Bot.)
- 1932 Pedler, E. G., 76 Queens Gate, S. Kensington, S.W.7. (Orn.)
- 1922 Pethen, R. W., 108 Northwold Road, Upper Clapton, E.5. (Orn., Ent.)
- 1931 Pethen, Miss Rita W., 108 Northwold Road, Upper Clapton, E.5. (Orn., Rept.)
- 1929 Phelan, T. C. E., 38 Richmond Road, Bayswater, W.2. (Orn., Bot.)
- 1932 Phillips, Mrs F. M., 9 Sylvan Hill, Upper Norwood, S.E.19. (Orn.)
- 1932 Phillips, H. H., 9 Sylvan Hill, Upper Norwood, S.E.19 (Orn.)
- 1931 Pinniger, E. B., 19 Endlebury Road, Chingford, E.4. (Ent., Orn.)
- 1927 Piper, Miss G. E. M., 12 Elms Road, Clapham, S.W.4. (Orn.)
- 1925 Poock, Sydney G., 17 Green Moor Link, Winchmore Hill, N.21. (Orn.)
- 1928 Poole, A. C., 42 The Mall, Ealing, W.5. (Orn., Bot.)
- 1910 Pratt, W. B., 10 Lion Gate Gardens, Richmond, Surrey. (Lep.)
- 1892 Prout, L. B., F.E.S., 84 Albert Road, Dalston, E.8. (Lep., Biol.)
- 1929 Pugh, Miss E. C., The Hill Farm, Stockbury, Kent. (Orn.)
- 1929 Purey-Cust, Miss Peggy, 49 West Hill, Highgate, N.6.
- 1927 Raikes, Miss D., 24 Launceston Place, Kensington, W.8. (Arch., Bot., Orn.)
- 1932 Raisin, Miss A. M., 3 Maurice Walk, Hampstead Garden Suburb, N.W.11. (Orn., Bot.)
- 1926 Rankin, The Hon. Lady, Kensington Palace Mansions, De Vere Gardens, Kensington, W.8. (Orn.)
- 1929 Reed, Miss J. B., 29 Thornton Hill, Wimbledon, S.W.19. (Orn.)
- 1930 Reeve, Miss E. A., The Penn Club, 9 Tavistock Square, W.C.1. (Bot., Orn., Ent., R.)
- 1929 Rew, E., 23 Chester Terrace, Regents Park, N.W.1. (Orn.)
- 1929 Rew, Miss M., 23 Chester Terrace, Regents Park, N.W.1. (Orn.)
- 1925 Richardson, Arthur, Barrowell Green, Winchmore Hill, N.21. (Orn., Ent.)

- 1928 Richardson, G., 74 Tulse Hill, Brixton, S.W.2. (Bot.)
- 1892 Robbins, R. W., The Rosery, Limpsfield, Surrey. (Bot., Lep., Orn., Arch., Plant Galls.)
- 1931 Robinson, Miss M., 26 Loraine Mansions, Widdenham Road, Holloway, N.7.
- 1931 Robinson-Embury, Lt.-Col. P., C.M.G., 51 South Street, W.1. (Orn.)
- 1932 Rosevear, D. R., Forestry Department, Victoria, British Cameroons, West Africa. (Ent., Bot.)
- 1910 *Ross, J., 18 Queen's Grove Road, Chingford, E.4. (Bot., Plant Galls, Orn.)
- 1932 Rotter, Miss G. H., Penmon, 2 Park Hill Road, Sidcup, Kent. (Bot., Arch.)
- 1890 Routledge, G. B., F.E.S., Tarn Lodge, Heads Nook, Carlisle, Cumberland. (Lep., Col., Hem.)
- 1931 Rowberry, E. C., 7 Burlington Road, Osterley, Middlesex. (Orn.)
- 1930 Rushen, W. N., 55 Kendall Road, Beckenham, Kent. (Orn., Arch.)
- 1932 Ryan, A. P., 19 Burnsall Street, Chelsea, S.W.3.
- 1929 Sampson, E. S., Thursley, Court Road, Banstead, Surrey. (Orn.)
- 1930 Scudamore, Miss M., 31 Ashchurch Park Villas, Ravenscourt Park, W.12.
- 1932 Seton, Sir Malcolm C. C., K.C.B., M.B.O.U., 26 Upper Park Road, Hampstead, N.W.3. (Orn.)
- 1929 Short, G. R. A., 201 Bedford Hill, Balham, S.W.12. (Bot., Micr., Pharmacognosy.)
- 1929 Shorter, Miss E. M. L., 75 Onslow Gardens, Muswell Hill, N.10. (R.)
- 1892 Simes, J. A., O.B.E., F.E.S., Kingsley Cottage, Queen's Road, Loughton, Essex. (Ent.)
- 1911 Simpson, W., M.B., B.S., D.P.H., The Ivies, 3 Adelaide Road, Andover, Hants. (Arch., Bot., Lep., Plant Galls, R.)
- 1892 Smith, A. C., 18 Mornington Road, Woodford Green, Essex. (Ent.)
- 1931 Smith, Miss A. M., Rambler Cottage, Blenkarne Road, Wandsworth Common, S.W.11. (Orn.)
- 1892 Smith, C. B., F.E.S., 61 Onslow Gardens, Muswell Hill, N.10. (Lep.)
- 1929 Smith, Mrs H. K., 61 Onslow Gardens, Muswell Hill, N.10.
- 1926 Smith, Miss M. H., 177 Holly Lodge Mansions, Highgate, N.6. (Orn., Bot., R.)
- 1931 Snell, A. P., 25 Anne Boleyn's Walk, Cheam, Sutton, Surrey. (Bot.)
- 1931 Snow, B., 3 Whitworth Road, S. Norwood, S.E.25. (Orn.)
- 1927 Solly, Miss B. N., 16 Sydney Street, Chelsea, S.W.3. (Orn.)
- 1927 Southern, H. N., 67 Holden Road, North Finchley, N.12. (Orn.)
- 1928 Sparkes, T., A.M.I.E.E., 23 Drayton Road, West Ealing, W.13. (Arch., Bot., Ent., R.)

- 1928 Sparkes, Mrs T., 23 Drayton Road, West Ealing, W.13. (Arch., Bot., R.)
- 1922 Spooner, Herman, 21 Musgrave Crescent, Walham Green, Fulham, S.W.6. (Orn., Bot., Arch., R.)
- 1927 Stanley, S. F., Eversley, The Crossways, Gidea Park, Essex. (Arch., Orn.)
- 1931 Story, P., 8 Albanley Gardens, Kilburn, N.W.6. (Orn.)
- 1931 Story, Mrs J., 8 Albanley Gardens, Kilburn, N.W.6. (Orn.)
- 1920 *Stowell, H. S., L.R.I.B.A., 26 Queen's Gardens, Ealing, W.5. (Arch.)
- 1927 Swain, A. M., 436 Blandford Road, Beckenham, Kent. (Orn.)
- 1930 Swayne, F. G., M.A. (Cantab), M.B., M.B.O.U., Beulah Spa Hotel, Norwood, S.E.19. (Orn.)
- 1928 Talbot, G., F.E.S., Mon plaisir, Wormley, Surrey. (Lep.)
- 1930 Tassart, Miss O. F., 36 Alfriston Road, Clapham Common, S.W.11. (Arch., Orn.)
- 1926 Taylor, Mrs K., The Vine House, Sevenoaks, Kent. (Orn.)
- 1930 Thacker, D. M. D., Broom Lodge, 168 Chase Side, Old Southgate, N.14 (Arch., Col., Aqua.)
- 1920 Thomas, Mrs G. E., 9 Talbot Road, Isleworth, Middlesex. (Orn., R.)
- 1927 Thresher, Miss G. A., 34 Henrietta Street, W.C.2. (Arch., Bot., Ent., Plant Galls, R.)
- 1931 Tours, H. J., 8 Harvard Road, Gunnersbury, W.4.
- 1892 Tremayne, L. J., F.Z.S., Avenue House, 21 Northumberland Avenue, W.C.2. (Bot., Lep., Arch., Plant Galls, Orn., R.)
- 1908 Tremayne, Mrs, Avenue House, 21 Northumberland Avenue, W.C.2. (Orn., Arch., Bot., R.)
- 1923 Trench, R. H., Hall Barn Cottage, Beaconsfield, Bucks. (Orn., R.)
- 1925 Tucker, Leslie F., Danebury, The Chine, Grange Park, Winchmore Hill, N.21. (Lep.)
- 1931 Underwood, R. A., Airla, Eskdale Avenue, Chesham, Bucks. (Orn.)
- 1927 Veitch, Miss A., 79 Shirley Gardens, Faircross, Barking, Essex. (Arch.)
- 1929 Venour, Miss D., 54a Dennington Park Road, N.W.6. (Orn.)
- 1927 Waller, G., 88 Beckenham Road, Beckenham, Kent. (Orn.)
- 1931 Wallis, Miss P. I., 59 East Sheen Avenue, East Sheen, S.W.14. (Orn.)
- 1925 Ward, Bernard T., 24 Long Deacon Road, Chingford, E.4. (Arch., Bot., Orn., Ent., Plant Galls, R.)
- 1920 Watkins, Miss H., 12 Connaught Avenue, East Sheen, S.W.14. (Orn., R., Bot.)
- 1926 Watt, Hugh Boyd, 90 Parliament Hill Mansions, Lissenden Gardens, N.W.5. (Orn., Ecology, Zoo., Bot.)
- 1925 *Watt, Mrs Winifred Boyd, 90 Parliament Hill Mansions, Lissenden Gardens, N.W.5. (Orn.)
- 1893 Wattson, R. Marshman, 32 St Andrews Road, Stoke Newington, N.16. (Arch., Ent.)

- 1928 Weeks, Claude, 7 Paynesfield Avenue, East Sheen, S.W.14. (Orn.)
 1929 Welch, John J., 19 Alexandra Road, Walthamstow, E.17.
 1931 Wheeler, Miss E. M., 28 Hardy Road, Blackheath, S.E.3. (Orn., Bot.)
 1929 Wheeler, E. P., F.R.I.B.A., Park Lodge, Park Road, Sutton, Surrey. (Orn., Arch.)
 1930 Whitbread, R., 6 Meadow Way, Weald Village, Harrow, Middlesex. (Arch.)
 1913 Wilde, Mrs C. L., Lindfield, Marshall Road, Godalming, Surrey. (Arch., Bot., Plant Galls.)
 1922 Wilkinson, E. B., F.L.S., 75 St Mark's Road, W.10.
 1931 Wilkinson, Miss M. O., Cartref, 157 Hale Drive, Mill Hill, N.W.7.
 1880 Williams, C. H., 5 Lower Belgrave Street, Eaton Square, S.W.1. (Lep.)
 1931 Williams, Miss J. G., 25 Paget Road, Ilford, Essex. (R.)
 1930 Williams, Miss P. H., Down Pantiles, Westgate-on-Sea, Thanet. (Orn., Bot.)
 1931 Wills, Miss A. M., 37 St George's Road, Buckingham Palace Road, S.W.1. (R., Arch.)
 1931 Wilmott, A. J., British Museum (Natural History), Cromwell Road, South Kensington, S.W.7. (Bot.)
 1928 Wilson, J., 115 Canterbury Road, Harrow, Middlesex. (Orn., Bot.)
 1931 Wing, J. S., 21 Cheyne Gardens, Chelsea, S.W.3. (Orn.)
 1929 Witherby, H. F., M.B.E., H.F.A.O.U., F.Z.S., M.B.O.U., 12 Chesterford Gardens, Hampstead, N.W.3. (Orn.)
 1931 Wright, P. F., Kenilworth, Kenley, Surrey. (Ent.)
 1922 Wright, W. A., 31 Beresford Road, Chingford, E.4. (Orn.)

Branch Associates:

- 1927 Boardman, Mrs Stuart, 45 Empress Avenue, Woodford Green, Essex. (Orn., Ent.)
 1930 Brightman, Miss A., St Osyth, Hempstead Road, Upper Walthamstow, E.17.
 1927 Chappell, Miss M., Monkams End, Monkams Lane, Woodford Green, Essex.
 1910 Cox, Oswald F., Croftdown, Shepherd's Hill, Highgate, N.6. (Bot.)
 1928 Culpin, Miss N., 39 Pretoria Road, Chingford, E.4.
 1922 Dupère, Miss Frances, 87 Station Road, Chingford, E.4.
 1920 Gain, Mrs E. R., 49 Buxton Road, Chingford, E.4.
 1926 Gamble, Mrs H. M. A., 9 Park Hill Road, Chingford, E.4.
 1927 Gamble, Miss E., 9 Park Hill Road, Chingford, E.4.
 1926 Gamble, Miss Winifred, 9 Park Hill Road, Chingford, E.4.
 1920 Hart, Miss H., The Green Farm, Chingford, E.4.
 1927 Holland, H., 27 Victoria Road, Chingford, E.4.
 1928 Holland, Miss M., 27 Victoria Road, Chingford, E.4.
 1928 Langford, R. E., 17 Brodie Road, Chingford, E.4.
 1925 Mancell, W. A., 22 Connaught Avenue, Chingford, E.4. (Orn.)

- 1911 Mathieson, Miss M. L., 7 Crescent Road, Chingford, E.4.
(Meteorology.)
- 1931 Overton, G. H., 44 Warren Road, Chingford, E.4. (Orn.)
- 1930 Penwarden, Miss C., 39 The Avenue, Chingford, E.4.
- 1927 Pettit, Mrs S., Colham, 2 Victoria Road, Chingford, E.4.
- 1927 Pettit, S., Colham, 2 Victoria Road, Chingford, E.4.
- 1920 Proctor, Mrs E. M., 10 Woodland Road, Chingford, E.4.
- 1925 Saul, H., Barclay's Bank, Chingford, E.4.
- 1931 Saunders, M. E., 57 Beresford Road, Chingford, E.4. (Bot.)
- 1930 Shadforth, Miss G. H., 35 Victoria Road, Chingford, E.4.
- 1930 Shadforth, W. R., 35 Victoria Road, Chingford, E.4.
- 1903 Stevenson, H. E., F.C.S., 22 Wilton Grove, Wimbledon, S.W.19.
(Chem.)
- 1927 Stopps, W. E., 6 Gordon Road, Chingford, E.4.
- 1927 Unwin, Mrs E., 7 Mount View Road, Chingford, E.4.
- 1927 Wilkes, Miss L., 24 Woodland Road, Chingford, E.4.
- 1929 Youé, Miss, 46 Station Road, Chingford, E.4. (Bot.)

Country and School Associates:

- 1924 Bailey, Mrs Stephen, Sutterton, Reading Road, Wokingham,
Berks.
- 1931 Basden, E. B., Budleigh, Farnham Royal, nr. Slough, Bucks.
(Dipt., Bot.)
- 1907 Bickham, Spencer H., Underdown, Ledbury, Herefordshire.
(Bot.)
- 1908 Bostock, E. D., Oulton Cross, Stone, Staffordshire. (Lep.)
- 1924 Collins, Miss Florence, School of Gardening, Clapham, near
Worthing, Sussex. (Orn.)
- 1929 Correspondent, The, Natural History Society, St John's School,
Leatherhead, Surrey.
- 1892 Culpin, Millais, M.D., F.R.C.S., Meads, Loughton, Essex. (Biol.)
- 1930 Foster, Mrs S., 12 Victoria Road, Bridgnorth, Shropshire. (Orn.)
- 1898 Hall, L. B., F.L.S., Lingdene, King's Avenue, Parkstone, Dorset.
(Bot., Plant Galls, Biol., Geol., Micr.)
- 1928 Harrisson, T. H., M.B.O.U., The Chase, Weeke, Winchester,
Hants. (Orn.)
- 1927 Harvey, F. B., The Nook, Rhodes Minnis, Elham, nr. Canterbury,
Kent.
- 1926 Hibbert-Ware, Miss A., F.L.S., M.B.O.U., Hilary, Girton, Cam-
bridge. (Orn.)
- 1915 Hopkins, Prof. Sir F. Gowland, M.A., M.D., F.R.C.P., F.R.S.,
71 Grange Road, Cambridge. (Biochemistry.)
- 1928 Jones, E. I., 50 William Street, Hampstead Road, N.W.1. (Ent.,
Orn.)
- 1929 King, W. F. W., Blue Coat School, Aldworth's Hospital, Reading,
Berks.
- 1902 Miller, Miss E., The Croft, Rainsford Lane, Chelmsford, Essex.
(Lep.)

- 1905 Moore, J. W., Middleton Dene, 151 Middleton Hall Road, King's Norton, Birmingham. (Lep.)
- 1930 Nicholson, C., F.E.S., Nansgwithick, Tresillian, Probus, Cornwall. (Ent., Bot., Orn., Astr.)
- 1932 Offen, Miss E., Ulva, Scott's Hill, Southminster, Essex. (Orn.)
- 1918 Pike, Oliver G., F.Z.S., M.B.O.U., The Bungalow, Leighton Buzzard, Beds. (Orn.)
- 1931 Spittle, R. J., Alaska, Farnham Road, Farnham Royal, Slough, Bucks. (Col., Orn.)
- 1914 Studd, E. F., M.A., B.C.L., F.E.S., Exeleigh, Starcross, Devon. (Lep.)
- 1928 Thoday, A. G., 31 Upper Brook Street, W.1. (Bot., Ent.)
- 1904 Ward, J. Davis, Limehurst, Grange-over-Sands, Lancs. (Lep.)
- 1924 Welch, R. J., M.Sc., M.R.I.A., 49 Lonsdale Street, Belfast.
- 1929 Willcox, P. H., Emmanuel College, Cambridge. (Ent., Bot.)

NOTE.—The following abbreviations are used in the above lists:—
 Api., Apiculture; Aqua., Aquaria; Arch., Archæology; Ast., Astronomy;
 Biol., Biology; Bot., Botany; Chem., Chemistry; Col., Coleoptera;
 Conch., Conchology; Dipt., Diptera; Ent., Entomology; Ethn., Ethno-
 logy; Geol., Geology; Hem., Hemiptera; Hym., Hymenoptera; Ich.,
 Ichthyology; Lep., Lepidoptera; Mam., Mammalogy; Micr., Micro-
 scopy; Neur., Neuroptera; Orn., Ornithology; Orth., Orthoptera; Ool.,
 Oology; R., Ramblers' Section; Rep., Reptilia; Zoo., Zoology.

*Signifies a Life Member.

Obituary.

JOHN CUTHBERT ROBBINS.

The sudden death of John Cuthbert Robbins in a motor accident, on the 11th April 1932, came as a severe shock to his many friends in the Society, a number of whom had known him from infancy and watched the growth of his character and career.

John was born at Hale End, Walthamstow, on 8th August 1905, and a few years later the present writer can well remember a very small boy excitedly announcing to him the finding of a Wryneck's egg in Epping Forest.

In 1916, at the age of 10, he obtained a presentation to Christ's Hospital, where subsequently he showed indications of his interests by becoming Secretary of the Hospital Natural History Society.

The Headmaster, Dr Hamilton Fyfe, recommended him on leaving for a vacancy on the staff of the Imperial Institute of Entomology, which he joined in 1922, being employed at first as Library Assistant and later on abstracting work for the Review of Applied Entomology, and gaining by that means a useful knowledge of several languages.

About this time he was attracted to the study of the Sawflies, in the first instance by observing the larvae of *Phymatocera aterrima* on a plant of Solomon's Seal in his father's garden at Limpsfield.

Later, while still on the staff of the Institute, he was allowed to devote half his time to an entomological course at the Imperial College of Science, and there joined the College Athletic Club, becoming their most prominent long distance runner. This success encouraged him to join the South London Harriers, with whose principal team he took part in several important races.

As further training for his future scientific career, he was transferred in October 1930 to the Farnham House Laboratory of the Imperial Institute, where the Superintendent, Dr W. R. Thompson, said of him—"He had already acquired a quite remarkable knowledge of the literature of the subject, and had developed to a really extraordinary degree a natural talent for patient and accurate investigation." Shortly before his death he had been selected to assist in an important scientific enquiry in the West Indies, to which he had been looking forward with enthusiasm.

In our own London Natural History Society, which he joined in 1922, he could always be relied upon for interesting records and exhibits. During 1924, at the age of 17, he was Secretary to the Archaeological Section, of which he was a keen member, being especially skilful at brass rubbing. He was elected to the Council in 1927, and subsequently served permanently on the Committees of Entomology and Plant Galls. In 1931 he became Publications Secretary and Editor.

His work on the Sawflies had been largely preparatory. He was particularly interested in the biology of the group, and had accumulated much material. His published papers include:—"Notes on the Life-History and Distribution of *Pteronidea spiraeae* Zadd.," *London Nat.*, 1926, pp. 11-15 and 10. " *Diplostichus janitrix* Hartig, a Tachinid Parasite of the Pine Sawfly, and its Method of Emergence," *Proc. Ent. Soc. Lond.*, 2, 1927, pp. 17-19. "The Larva and Food-Plants of *Emphytus carpini* Hartig," *London Nat.*, 1928, pp. 18-20. "On a Pine Sawfly (*Diprion sertifer* Fourc.) and its Parasites," *Trans. Suffolk Nat. Soc.*, i, pt. 3, 1931, pp. 177-179.

He was elected a Fellow of the Entomological Society in 1926, and was also a member of the Suffolk Naturalists' Society and the Société d'Etudes Scientifiques d'Angers.

His open and attractive character, his keen mind and love of study, and not least, his modesty and reliability, endeared him to all, and make it only too evident that our Society has suffered a most grievous loss, and Science a truly promising life which it can ill spare.

C. L. C.

MRS E. L. ROBBINS.

We deeply regret to have to report the death of Mrs E. L. Robbins, who, as Miss Simmons, joined the North London Natural History Society in 1893, being one of our first four lady members. Until her removal to Limpsfield in 1916 she was almost continuously on the Council, and from 1904 to 1909 acted as one of the Joint Secretaries. She gave holiday papers at meetings in 1894 and 1901, and read one on "Plant Life in Winter and Spring" in 1905. Her interest in the Society's activities never flagged, whether she were able to be present at its meetings or not.

When settled at Limpsfield she soon became connected with local affairs, being treasurer of the Infant Welfare Association for three or four years, and afterwards a worker on the Weekly Committee. In 1927 she was on the Children's Care Committee of Limpsfield School, and for the last two years had been one of the representatives on the General Care Committee of the Godstone district.

Mrs Robbins' interest in natural history was as comprehensive as it was genuine. In all its forms and aspects, whether of art, literature or nature, beauty appealed to her and was thoroughly appreciated by her. Her happy home life reflected her sunny and equable disposition, which doubtless helped her to sustain that high courage she showed in the face of shock and trouble.

H. K. S.

EDWARD SAMUELSON.

Mr Samuelson's many friends in the London Natural History Society learnt with pain that he passed away at his home at Long Bennington, Lincolnshire, on 2nd February 1932. He had suffered from an internal

chill, but no anxiety was felt; his end came without warning and with but slight pain, as a result of heart failure.

To members of the Society Mr Samuelson was best known for his long and devoted service to the Chingford Branch. He joined the Society when the branch at Chingford was formed in 1910, and at once became an active member. After being Chairman of the branch for two years, he succeeded Mr J. O. Braithwaite as branch Secretary in 1914, and continued in that office until 1928, when he left Chingford. It was due to Mr Samuelson's loyalty and energy in promoting the interests of the Branch, to his persistence in obtaining new members, and to his constant endeavours to maintain the attendances at meetings that the Chingford Branch survived the war years. The Society acknowledged its debt to Mr Samuelson by electing him one of its few honorary members when he left the district.

It was Mr Samuelson's wont to represent himself as a lover of nature and not a scientist, but his scientific knowledge was often found to be more extensive and more accurate than he would have his friends think. In his early years he had opportunities of meeting well-known scientists and public men. His father, Mr James Samuelson, was a much travelled man, and the author of a series of books. His uncle, Sir B. Samuelson, Bt., established highly successful iron and steel works at Middlesbrough, was a well-known Member of Parliament, and a prominent advocate of education in the times when education needed advocates. Many years of Mr Samuelson's active business life were spent in Switzerland and elsewhere on the Continent.

Mr Samuelson had a fine eye for natural beauty, and was clever with his brush. His knowledge of Europe and European affairs, his intimate acquaintance with the most picturesque parts of England and Wales, his diverse associations and interests, and his reminiscences made him a delightful companion on those strolls in Epping Forest and in other country districts that were one of the pleasures of his later years. Also he had to an unusual degree the capacity to take a true and enlightened interest in other people's hobbies.

ROBERT PATTERSON.

Dr Patterson was an ardent naturalist and a genuine boy-lover. When the Boy Scouts' Camp at Gilwell Park was still a very young undertaking, he obeyed an urgent call to bring order into it, before the days of the wonderful organisation that holds there now. Having done this, he stayed on for some years to the general content of the community. For the blend of nature and boy-love was just what was needed. It was a familiar, daily sight—that of Dr Patterson accompanied by a small crowd of boys, walking briskly and engaged in cheery, healthy talk about birds, flowers and insects or about their homes or camping pursuits. Birds were probably his chief interest and nothing pleased him more than to describe, with the help of lantern slides, his adventures among gannets and other sea fowl. The writer recalls an amusing epi-

sode in connection with the food pellets of birds, in which Dr Patterson became much interested. He wished to borrow some whilst lecturing and gave a message to be brought to me by a Swiss girl. The touch of Irish in his speech produced the request that "Dr Patterson wishes to borrow some old pullets." After some deliberation, we sent him, to his satisfaction, some owl pellets! It is sad to think that his bright and stimulating personality has passed from us, but there must be many young men who will always remember with affection and gratitude the inspiring influence on their lives of Dr Robert Patterson.

A. H.-W.

JAMES JOHN JOICEY.

Mr Joicey, who joined the Society in 1928, died suddenly at Witley, Surrey, on the 10th March 1932, aged sixty-one.

He did not attend the meetings of the Society, but on several occasions had shown portions of his magnificent collection of lepidoptera at the annual exhibitions.

The closing down of the Hill Museum, which he had maintained at Witley for the past twenty years, will be a matter of much regret to entomologists throughout the world.

Studies on the Biology of Fleas.

By PATRICK A. BUXTON, M.A., M.R.C.S.,
London School of Hygiene and Tropical Medicine.

(The substance of the Bacot Memorial Lecture, delivered on
31st March 1931.)

IN this paper I propose to discuss certain investigations which Bacot made upon fleas, and to describe advances in knowledge which have been made on the foundations which he laid. It is well known that plague is a disease which attacks many sorts of rodent; it is caused by a bacillus (*Bacillus pestis*) which may generally be found in the victim's blood; the disease is transmitted from one rodent to another mainly by fleas, which acquire the bacillus when they imbibe the blood. On the rodents one finds species of fleas, some of which are peculiar to a particular host, though others are much more general in their choice, and it is because the fleas are, to some extent, promiscuous that the plague bacillus is spread from one species of rodent to another. For a similar reason, the disease does not spread to a few sorts of rodent which are unattractive to the generality of fleas, though they have their own more specific parasites. Among others, domestic rats are frequently attacked by the disease, and since many of the species of fleas which live on them will also bite man, human beings become infected; but it is broadly true to say that every human case of bubonic plague should be regarded as a separate overflow of the disease from the rats to the human community. The story of plague is further complicated because the rats with their fleas are frequently carried in ships and trains, so that human activities spread a disease most dangerous to man.

Let us now select a few parts of Bacot's work upon fleas. The larvae of different species of fleas have been described by many authors, but a notable contribution to our knowledge was made by Bacot and Ride-wood. They were, I think, the first to direct attention to the fact that the structure of the mandible of the larva is often of value in identifying different species and genera. This work has recently been carried further by Miss E. K. Sikes, who has shown that differences can be detected between the larval mandibles of species of the genus *Xenopsylla*. On the whole, however, the larvae of fleas are very similar to one another, and it is not likely that we shall ever be able to distinguish between the species with any ease. The studies which have been made have given a negative result in another respect also; they have not thrown any light on the probable ancestry of the fleas, which are still a small compact Order (Siphonaptera), without any demonstrable relationship to any other group of insects.

When Bacot was breeding fleas, he made one observation of considerable interest. He found that the larvae of many species, though they eat organic refuse promiscuously, could not be successfully reared

unless a small proportion of dried blood was added to the material in which they were kept. In nature the larvae obtain this by eating the faeces of the parent fleas, who swallow very large quantities of blood and pass much of it in an undigested condition. Bacot showed, moreover, that dried blood was much more necessary to the larvae of some species of fleas than of others; so that those, such as *Ceratophyllus fasciatus*, which need it are practically confined to the rat's nest, whereas *Xenopsylla cheopis*, the larvae of which are apparently independent of blood, can afford to drop its eggs anywhere. This flea, therefore, is found rather on the rat's body than in its nest. This apparently trivial difference in biology has perhaps an important effect in determining the relation between particular species of flea and the transmission of plague to man, for it is evident that *Xenopsylla* is much more likely to be carried into human dwelling-houses than is *Ceratophyllus*. Miss Sikes has recently carried the matter yet further. She finds that the female flea generally defaecates just by the egg when it is deposited. The minute quantity of altered blood contained in this one deposit of faeces may be eaten by the larva on emerging from the egg. If it is desired to study the effect of depriving the larva of the faeces of parent fleas, care must be taken to collect the eggs one by one from the tube in which they were deposited, and to keep them in a clean tube.

There is another biological fact of great importance, our knowledge of which is, to a large extent, due to Bacot's researches. It has been known for a very long time that in many countries plague has a definite seasonal incidence, and it has been known for about 30 years that rat fleas have approximately the same periodicity. It was shown by the workers of the Plague Commission in India, and also by Bacot, in the three or four years which preceded the war, that the numbers of rat fleas were probably determined as much by the humidity as by the temperature of the atmosphere. Bacot's work was hampered by the difficulty—which has now been overcome—of exposing insects to any desired degree of humidity, and this prevented his breeding his species at a sufficient number of combinations of temperature and humidity. But his data, though incomplete, were sufficient to allow me to make graphical use of them. I was then working in Palestine, and there was an outbreak of plague in rats and men in Jaffa, in the summer. We wondered whether it would continue throughout the year, or whether the winter in Jaffa would prove unfavourable and stop the epidemic by reducing the number of fleas. I was able to plot the conditions of temperature and relative humidity which were favourable or unfavourable to *Xenopsylla cheopis*, taking the facts from Bacot's published work; I superimposed on this graph a transparent sheet, carrying the mean monthly conditions for Jaffa plotted on the same scale. It seemed improbable that *X. cheopis* would remain common in winter, and in fact the epidemic died out. Using this approximate and rather crude method, it was possible to show that there was a good coincidence between Bacot's facts and what was known about the incidence of plague in other towns which were studied. Work is now going on in the London School of Hygiene and Tropical Medicine under better experimental conditions

than were obtainable 20 years ago, and we hope before long to present a more complete picture of the relation between several species of rat flea and the temperature and humidity of their environment. We are also bringing into use various methods for measuring the humidity of the air in the actual places in which the insects breed, and I hope to employ these methods in Palestine in the coming summer: till now, we have always had to rely on ordinary meteorological data, which are not applicable to our problem. There is reason for thinking that atmospheric humidity is so important to fleas and to many other insects, because it may affect the proportion of water in their bodies. We owe to Bacot and Martin the first really scientific study of this subject: they made an important contribution to insect physiology when they showed that, within certain limits, the duration of the flea's life is directly determined by the saturation deficiency of the atmosphere. We cannot turn from this subject without calling attention to the minute quantities of water which are involved. The flea (*Xenopsylla cheopis*) weighs 0.6 mg., that is to say, there are about 40,000 of them to the ounce. About two-thirds of the flea are water, but probably a very slight disturbance of the percentage of water in the insect may be harmful, or fatal, or perhaps cause the larva to enter into a resting stage before pupation. It is becoming clear that studies in water balance of fleas and other insects may lead to great advances in our understanding of the relation between these creatures and climate. It will be clear to you also that the work is difficult and that much of it is what the self-styled practical man would call "useless and academic."

There is one other part of Bacot's investigations to which the reader's attention should be directed. In the closing years of the last century it was suggested that plague was transmitted by fleas; by 1905 it had become an established fact that this could occur, and that it was the regular channel by which rats and men became infected. But there was no knowledge of the exact mechanism. It was debated whether the infection in the flea was in the salivary glands or in the proboscis or in the faeces of the insect, and the precise channel of transmission to the mammal was only defined in 1914 in an important paper by Bacot and Martin. They showed that when the flea takes up infected blood the plague bacilli multiply in the alimentary canal of the insect; frequently they multiply in the proventriculus, which is a complicated valve controlling the entry of blood into the mid-gut. Their multiplication at this site sometimes blocks the proventriculus, so that when the flea again sucks blood it cannot pass it into its mid-gut. In that event, the blood becomes contaminated by plague bacilli derived from a previous meal, and it washes back on to the insect's mouthparts and into the wound in the animal's skin. A flea in this "blocked" condition, unable to take food or drink, probably dies more rapidly, particularly in dry air, than a normal flea would. Perhaps, therefore, the range of climatic conditions which are really favourable to the transmission of plague is still narrower than the range which is favourable to the life of the normal insect.

May I, in conclusion, point out that these investigations cannot be said to belong to any one science? The work may be done by an entomo-

logist, a bacteriologist, a meteorologist, or indeed by some other man of science. These workers take a part of the subject and treat it analytically. But the complete view, which is synthetic, must be based on a knowledge of the work of all of them, and I think that the only appropriate way of viewing the problem is the ecologist's. We must endeavour to see the flea set in a complex environment of food, climate, enemies, parasites; many sorts of mammals are hosts of the fleas and are therefore involved, and they in turn live in a complex environment of which they are a part; man, with his commerce, his transport, his different methods of housing himself, adds complexity to the picture. Moreover, many of the factors in the insects' environment are continually changing and affecting the flea or disturbing some other factor, so that the more we study the situation as a whole the more does it become complex and fascinating. This point of view, which is no more than systematised natural history, is the one which we must endeavour to make our own in studying the relation between fleas and plague.

An Introduction to the Study of Plant Galls.

By H. J. BURKILL, M.A., F.R.G.S.

The substance of a paper read to the Plant Galls Section,
22nd December 1931.

When I started to study plant galls in 1898 books of reference were few, and the information was very scattered. Now we have a number of books that will be of use to the student. Among these may be mentioned:—

- (1) Swanton's *British Plant Galls*, published in 1912.
- (2) Connold. *British Vegetable Galls*, 1901.
- (3) Connold. *British Oak Galls*, 1908.
- (4) Connold. *Plant Galls of Great Britain*, 1909. (Price 3/6.)
- (5) Houard. *Les Zooecidies des Plantes d'Europe et du Bassin de la Méditerranée*, 3 vols., 1908, 1909, and 1913.
- (6) Adler and Straton. *Alternating Generations: A Study of Oak Galls*, 1894.

Of these Swanton may be regarded as the best for a beginner, but as a catalogue of our British Galls it is now out of date. However, it is now out of print and I believe second-hand copies are hard to obtain. A lot of information on the subject has appeared in various magazines and journals in the last few years, but this has usually taken the form of records of the occurrence of species in different localities. We are promised a book shortly by Messrs Bagnall, Bartlett and Harrisson, which we hope will bring us up to date as regards Great Britain.

Galls may be described as abnormal growths of the plant caused by some intruding outside agency. The word "outside" may seem at first sight to require a certain amount of qualification, as the agency may not always be apparent as an "outside" one, but whatever may be the status and position of the agent at the time that the gall growth is visible, the exciting cause has been introduced from the outside.

We may get minute worms—Eelworms, inside the plant setting up extra growth by means of the irritation caused by their presence, but these eelworms have come from the soil, penetrating into the roots from outside.

Fungi may find their way into the tissues of the plant and induce swellings. Insect eggs may be laid on the outside of the plant and the tissues may swell up round them, or the larvae from these eggs may eat their way into the plant, or the eggs may be laid by the parent directly into the tissues themselves. Thus, wherever we find the causers of the gall growth they have always come from the outside.

The growth, which takes the form of an increase in the cells of the plant structure, is due to irritation caused by the introduction of fluid or of a solid body. It has been suggested that it may be induced by chemical action by a fluid introduced with the egg in the case of the Sawflies, or it may be caused by the mechanical stimulus of the insect's proboscis or jaws, or the Eelworm's style, or merely by the presence of these creatures.

The plant endeavours to repair the damage by sending more fluid to the affected parts with the result that a largely increased growth of cells takes place, and these cells may be so altered in shape and nature that they produce very different forms of growth from the normal.

There are some galls of the simpler forms where possibly there is no extra growth, but merely normal growth in the unaffected cell layers, with restricted growth in the attacked cells owing to the drainage of the juices in these cells, which consequently tend to remain small instead of developing in the usual way. For instance, there are some galls due to the presence of Aphides which suck the cell layers on the under surface of the leaves, thus rendering them diseased and unwholesome while the upper layers continue to grow and so produce a curvature of the leaf, and by continuing this process produce a loose rolling with a concavity in which the Aphides live and breed. Elm leaves may be curled up from end to end by one species or from side to side by another closely allied species. Any part of the plant may be attacked and transformed into a gall. I do not mean by this that every plant is liable to be attacked in every part, but that on certain species of plants there may be found definite galls on the different parts, as for instance the Common Oak with galls on its roots, its trunk, its branches, its twigs, its leaf buds, its leaves, its male flowers, and its acorns. The Common Oak is *par excellence* the host plant for gall insects and provides some of our most interesting problems. The Willows are a group very liable to gall attacks. The Compositae have a number of galls, mostly in the flower heads, but there are others on the leaves, stems, and roots. The Roses bear a few characteristic galls, and there is interesting work to be done

here in seeing what species of galls are found on the various species of Rose, and whether there is any preference for the different groups into which botanists have classified the roses.

Occasionally a gall species may attack its host plant in more than one part, as for instance on *Salix*, where we have a midge (*Rhabdophaga heterobia* H. Loew) laying eggs in the male catkins, causing them to swell and to remain on the twigs after the other catkins have fallen. This midge also lays in the terminal leaf buds, causing a small rosette to form at the end of the twig. Another midge (*Rhabdophaga salicis* Schrank) will attack the fresh twigs of the year and lay a number of eggs in the soft wood, which then swells up to four or five times the diameter of the original as the larvae feed inside the twig. She will lay an egg in the mid-rib of a leaf and so give rise to a more fleshy gall, which, of course, falls when the leaf falls, while the twig galls persist for years as old swellings on the tree. There is a similar instance on Oak, a fly in quite a different family, one of the Cynipidae, *Andricus trilineatus* Htg. lays in the fresh soft green twigs, causing small irregular swellings, or in the older hard woody twig, where a series of small lumps under the bark indicate the gall cells, or she may lay a row of eggs in the mid-rib of a leaf. If, however, the egg be laid in the wrong place in the plant tissues gall formation does not occur. The insect has to reach the right layer of cells in the tissues or the oviposition is abortive.

We use the term "causer" for the agent as it does not make the gall, but by its action or presence causes the gall growth by inducing an abnormal activity in the plant tissue.

Galls are generally described as "simple" or "compound," and though one can see vast differences between most of the forms yet there are some that grade so insensibly into the intermediate state that one can hardly draw a line between the two classes.

The simplest galls are probably those where the midge larva lives on the under surface of the leaf, attached, goodness knows how, for it has no feet, but growing there, and by its sucking producing a slight concavity in the lamina of the leaf on the under surface, with a corresponding slight elevation on the upper surface, which generally shows some slight discolouration. After the larva has fallen to the ground to pupate the galled portion of the leaf dies, and it is sometimes these dead cells that give the only indication of the gall. There is a lamina gall on Maple which is very abundant in some years on the Surrey Hills, and was also extraordinarily plentiful in Shropshire in 1929, in which the pit where the larva lives is deeper, especially in the centre, and when the larva falls the gall rapidly decays and falls from the rest of the leaf, leaving a circular hole which is readily seen.

From this form it is only a slight step to the gall inside the leaf, a very similar circular spot, but here the larva is in the tissues, which swell into a small dome, usually very slight, and in some cases there is the concavity below, while in others there is a swelling, not so pronounced as on the upper surface but yet just sufficient to be detected. Both the upper and the lower surfaces of these galls are generally thin by the time the larva has fed up. It then drops through the lower skin

to the ground if it is a species that pupates in the soil. Some of them, however, pupate in the gall, and it may be that this characteristic is the only guide one has to the identity of the insect in closely allied species. A slightly more developed form is very similar, but in this case extra gall growth is induced inside the lamina of the leaf, and a slightly woody wall is formed round the larva.

One might well ask what is the difference between these forms of galls and the mines that so many insects make in the leaves. It is a perfectly sound question, and sometimes it seems as if there were really little difference, but in the mines we get only destruction of tissues, never replacement or further development. There is one small moth (*Nepticula argyropeza* Zell.) whose larva feeds in the upper portion of the petiole of a leaf of *Populus tremula* L., causing a small elongated swelling by inducing an extra growth of the tissues to form a gall. When half grown the larva eats its way from the petiole into the lower part of the leaf. Here it starts a mine, eating away the inner tissues of the leaf but not causing any fresh growth on the part of the plant. This is interesting, since it seems to indicate that the larva has lost the power of stimulating the plant, so that an extra supply of cell-forming material is no longer sent to the attacked spot. It may be that the plant growth has slackened off owing to the approach of autumn, but I think the first suggestion is the more probable one, as the galls are well developed in July when the tree is vigorous. If the stimulus were continued and remained equal one would rather expect more response in the softer cell tissue of the leaf than in the firmer cells of the petiole.

Mines are many and various and often show up as a slight raised area with a loose skin rather like a water blister, while the surface of a gall is firmer and more solid, but, as I have said, the difference between the two forms may to all appearances be very slight. It is the question of growth that characterises the gall. How this is brought about has already been touched upon.

Many Midges are responsible for simple galls, the larvae causing sometimes, according to the species, the margins of the leaves to roll upwards and inwards, sometimes downwards and outwards. It may be only a single curl, or it may be a simple fold, but sometimes it is more, and the larvae live inside these rolls. The rolls may be hairy or glabrous inside. Many leaves normally devoid of hairs develop them under the influence of the presence of the midge larvae. The stimulus to the cells forming the cuticle of the leaf is such that hairs are developed from these cells. These hairs are interesting as they vary on the same leaf according to the species of gall-causer attacking the leaf. The simplest forms of these hair-galls are due to the presence of gall mites which, by sucking with their mouth-parts, usually on the under surface of the leaf, induce the growth of a mass of hairs which may—as has been stated—assume very diverse forms, and from these growths the agent can be diagnosed. Along the mid-rib and veins of many leaves hairs are to be found, usually cylindrical, uni- or multi-cellular, pointed and colourless, but the presence of the mites (*Eriophyidae*) may largely increase the numbers of these hairs, especially in the angles between the

veins, where dense tufts are formed, in the midst of which these minute mites live and multiply. On the lamina of the leaf there may normally be no hairs but the irritation caused where the mites suck will produce a growth of hairs, which may be cylindrical or flattened, sharp pointed, blunt, club-ended or cauliflower shaped, unicellular or multicellular, simple or branched, straight or curved, sometimes hooked like a shepherd's crook, or twisted; coloured or colourless. Their forms can be seen under the microscope, and the different characteristics of these hairs help in the identification of the mite.

The mites are invisible to the naked eye, and they are often hard to discover under the microscope. We can see the traces of their presence in these patches of hairs and the distorted leaves or enlarged buds, but the mites themselves often seem to have vanished when their handiwork is most conspicuous, and it is possible that the irritation once started, the growth may continue after the mites have left the gall. One cannot lay down any hard and fast rule over these things—each species has to be taken separately.

Some galls have fleshy projections sticking up from the leaves which are merely extra malformations of the tissues, as in the galls so common on the top of our hawthorn hedges. These little projections seem to mean nothing unless they are something more for the larvae to feed on, as the larvae in this case crawl among them. Much more pronounced are the fleshy spines on one of the galls on rose leaves. We have a common gall on Rose, a smooth spherical gall which shows no signs of prickles or thorns coming through (*Rhodites eglanteriae*), but the galls of *Rh. spinosissima* on *Rosa spinosissima* frequently carry the small sharp prickles of the plant. *Rh. nervosus* galls on *Rosa* sp. are furnished with sharp-pointed fleshy spines to the number of three or more sticking up from the surface of the gall. They are solid and have nothing to do with the larval cell in the centre of the gall.

The galls on the stems of the common Thistle carry the sharp prickles, showing that the growth has taken place from the inside and has pushed the skin outwards.

Another Rose gall is the Robin's pincushion (*Rhodites rosae*) and it is much more complex than the other kinds found on the rose as it contains in the centre a hard mass of woody cells and on the outside a mass of coloured filaments looking more like moss than leaves. The eggs are laid in a soft bud but the properties of the bud become so completely changed by the presence of the egg or larva that the tissues develop into very different structures from what they would be in the normal state.

Woodiness may appear in the midst of soft tissues as in the case of the Black Knapweed, which, when attacked by a fly (*Urophora solstitialis*), becomes extremely hard at the base of the florets.

The mites attacking the leaf buds of Birch cause an enlargement of the buds with later on a thickened growth of the twigs and other parts until a solid wooden block is formed with a mass of twigs radiating out from it. This formation is known as a "Witches Broom." It is frequent on Birch, and seems to be helped in its later stages by the presence of a minute fungus (*Exoascus turgidus* Sadebeck), whose threads

penetrate between the vegetable cells. Similar growths may be seen on Hornbeam due to another species of fungus, *E. carpini* Ros., and here there do not seem to be the mites.

Big buds are also found on various plants such as Hazel, Black Currant, and Gooseberry, Yew, etc., but the galling stops at the bud and does not produce any woody growth. Instead, the bud is killed by the mites. The growth of leaves may be so stimulated that they develop in advance of their proper time. Flowers may be completely metamorphosed by the action of the intruder. The flower bud may be swollen, discoloured, fleshy, and so altered within that the parts are not recognisable. The stamens and pistil may be changed into thin filaments, largely increased in number, and the petals may be duplicated or they may be reduced to thin thread-like projections. Leaves and flower buds may be so massed together that the plant is almost unrecognisable, and a definite identification can only be arrived at from an examination of the neighbouring plants to see if there are any that have escaped the attention of the parasites.

The Causers are Insects, Mites (*Eriophyidae*, etc.), Eelworms (Nematodes), Rotifers (on very primitive plants), and Fungi.

The Insects include:—

Coleoptera: *Saperda*; Weevils (*Curculionidae*).

Hymenoptera: *Cynipidae*. *Chalcididae* (*Isosoma*). *Tenthredinidae* (Sawflies).

Diptera: *Cecidomyidae*. *Muscidae*.

Lepidoptera: *Sesidae*. *Pyralidae*. *Pterophoridae*. *Orneodes*. *Tortricidae*. *Nepticulidae*.

Hemiptera: *Psyllidae*. *Aphididae*. *Coccidae*.

The Romney Marsh and its Birds.

By H. L. LACK, M.D., F.R.C.S.

THE Romney Marsh lies on the south coast of Kent and the adjoining part of Sussex. Excluding a narrow strip at each end it extends from Hythe on the East to Rye on the West, forming an area some twenty miles long by four to eight wide. Its northern boundary is a range of low hills, the original cliff line, which now turns inland from the coast at Hythe and circling round the Marsh reaches the sea again at Fairlight near Hastings. A more precise but partly artificial boundary is formed by the Rother River from the sea to about three miles above Rye, and thence by the Royal Military Canal which runs from the Rother along the base of the hills to within a few yards of the sea at Hythe. The Marsh consists mainly of grass land divided up and drained by numerous dykes. Much of the land lying below the level of high tide, the sea is kept out by artificial banks or "walls" of clay. The water from the dykes is collected into canals and these discharge into the sea through sluice gates which open at low tide and are closed as the tide comes in. The Marsh includes two large areas of shingle, one at Hythe the other at Dungeness. The latter, the larger and more important, is some three miles across, has practically no soil and consequently a very scanty and stunted vegetation. Near its centre are two large ponds known as the Hoppen Pits; the word "hoppen" merely means open. On the West side of Dungeness at the edge of the shingle area are several shallow pools, the Midrips. Scattered over the Marsh are other larger or smaller shallow sheets of water, called fleets or bracks, which vary much in extent with the season and rainfall. The climate of the Marsh has been said to have the highest sunshine record and the lowest rainfall in England; snow and ice are very rare, but it must be one of the windiest places, and possibly for this reason there are only few and stunted trees near the coast.

The sea in the bays to the East and West of Dungeness is shallow, but off the Point it is deep right up to the shore. The Marsh is of recent formation, the Eastern, the oldest part, was reclaimed less than two thousand years ago, the last part, Greatstone, within the last fifty years. The history of the Marsh is interesting and largely dependent upon the River Rother. This river entering the Marsh at the North-West corner at first flowed down the East side to Hythe. The Romans sailed up the river as far as Lympne, where they built a large port (Portus Lemanis), the ruins of which can still be seen on the hill side. But the river silted up, the port was ruined, and the Rother formed a new channel crossing the centre of the Marsh to reach the sea between where New Romney and Lydd now stand. Soon after, the Eastern part of the Marsh was reclaimed by building the Dymchurch wall to keep out the sea, and the Rhee wall to keep the Rother to its new bed. Both these walls still

exist, the Rhee wall carrying the road across the Marsh from Appledore to New Romney. The Romans could still sail their flat-bottomed boats across the Western part of the Marsh right up to the hills. Romney now became a gateway of England and gradually grew in importance until it became the chief of the old Cinque Ports. In 1287 a terrible storm drove sea and shingle into Romney, silted up the port and ruined the flourishing town. The mud stains left by this flood can still be plainly seen on all the Norman columns in the interior of the old church up to the level of about four feet. The floor level of the church is also considerably below the level of the surrounding road. The Rother for the third time had to find a path to the sea and this time made its way down the Western side of the Marsh past Rye. All through the Middle Ages and up till Stuart times Rye was the Gateway of England, but it gradually lost its importance as the Atlantic trade developed and ships became too large for its shallow harbour. To-day, after nearly two thousand years, Lympne as a great air port has again become the gateway of England. The Marsh villages and churches are all quaint and old and well worth exploring. The Marsh folk have many curious words such as "lookers" meaning shepherds and "owlers" meaning smugglers. They also play a curious and unique game, called goal-running, a sort of chevy. The Marsh has remained isolated and unspoilt up till recent times, but now motors, bungalows, and a light railway along the coast are fast ruining it.

Between Littlestone and Dungeness the sea at low tide goes out for nearly a mile, uncovering acres of rich mud flats. Here come to feed flocks of Waders and Gulls together with Duck, Terns and other birds. The best way to see these birds is to take up a position on the edge of the shingle as the tide begins to ebb and then as the mud banks become uncovered the birds fly along in flocks and settle at one's feet. One thus sees them both in flight and whilst feeding, and much closer than if one attempts to walk up to them. A good observing place is almost anywhere within one or two miles from Dungeness Point, that is somewhere between the Pilot Inn and the Lade station. Greatstone Marsh, lying between Littlestone station and the shore, is a large, open, treeless space with some shallow fleets and a small sewage farm. It is best to visit this at high tide when the birds are driven off the beach. Numerous Waders may then be seen especially in spring and autumn. Dungeness shore from the "Pilot" all round the Point is one of the best places for observing sea-birds, Gulls, Skuas, Divers, Ducks, etc. Near the old Lighthouse are some stunted bushes where many of the smaller and sometimes rare migrants may be seen in spring and autumn. The most interesting time to visit the Hoppen Pits and the surrounding shingle is the nesting time of the Gulls and Terns. It is best to write to the R.S.P.B. and to enlist the services of Mr J. Tart, their watcher, a good guide and observer. The Midrips are worth a visit of at least half a day at all seasons as almost any bird may turn up there. The new R.S.P.B. preserve at Cheyne Court near Brookland, especially famous for its Ducks, is perhaps most interesting in the nesting season, but many birds may be seen there in autumn and winter.

Near Fairfield Church, a small and ancient structure erected by Thomas a'Becket, is another large fleet, the resort in winter of numerous duck and occasionally of geese. One should also spare a day to walk along the banks of the Royal Military Canal, especially the part between Appledore and Ham Street. They are most attractive in their spring beauty as well as for their numerous birds. All these Marsh resorts may be visited at any season, but July and August are perhaps the least pleasant, and for the bird observer the least profitable times.

The status of the great majority of birds on the Marsh is the same as that in the surrounding country. It would merely be tedious to give a list of all the birds seen or even to enumerate the rarities, although for anyone seeking rarities, particularly Passerines and Waders, the Marsh is one of the best spots in England. I will simply mention some of the more interesting features of bird life that we have ourselves seen. "We" includes my two sons, and I am particularly indebted to my eldest son who has allowed me to correct and supplement my memories by reference to the bird diary which he has kept for the last six years.

Owing to the absence of woods and copses with their undergrowth certain woodland birds are absent, or only rare stragglers on the edge of the Marsh, although closely related species may be abundant. Thus the Jay is absent although the Magpie is remarkably common. Although there are no pine trees in the 1927 "invasion" a small flock of Cross-bills visited the Marsh and were seen by my son feeding on thistles. They were very tame and easy to approach. The Goldcrest is common on migration and used to nest in Romney, the Cole and Marsh Tits are not seen. We have no personal records for the Bullfinch, Nuthatch or Nightingale. The Green Woodpecker is common all over the Marsh but especially along the banks of the Royal Military Canal where the trees are just ripe for it. Here one day in spring we saw quite a large "flock" of them, there might have been a score though it seemed more as five or six birds flew out of each tree as we walked along the canal banks. The other Woodpeckers are extremely rare, we have seen only one Lesser Spotted (on the canal banks), and no Great Spotted. One Wryneck visited our Romney garden several days one autumn and we were told it had nested near by.

The absence on the Marsh of their accustomed nesting facilities reduces some birds to strange shifts. The Mistle Thrush is very common but suitable trees are rare. We found one nest in a gorse bush on the golf links not more than three feet above the ground, and another in a thorn bush some four feet up. Strangest of all we found a nest on the top of a wooden breakwater where the waves at high tide actually sent their spray over the sitting bird. Mr H. G. Alexander saw a nest on the top of a wooden rail and post fence. Linnets breed in quite a large colony in some isolated bushes on the sand hills of Greatstone as well as in the surrounding marram grass. On Dungeness where there are no rabbit burrows the Wheatear builds its nest under the shelter of old tins. The Heron is common everywhere but there is no heronry. I have seen one nest on Dungeness in a low elder bush and in the following year there was actually a nest on the ground. At St David's in South-west

Wales where there are similar conditions, many Herons and few trees, there is a heronry on the high cliffs overhanging the sea, the nests being placed on the rocky ledges. On the shingle of Dungeness we have also seen a Mallard's nest, in a stunted thorn bush some 400 yards from the sea, and a Redshank's nest in such a thin patch of grass that the nest was absolutely open like a Lapwing's.

Before discussing the Ducks, Waders and Seabirds a few other birds may be shortly mentioned. Of the Hawks the Kestrel is very common, the Sparrow Hawk is rather rare, a pair of Peregrines occasionally visit Dungeness, and we have seen Merlins in late autumn. All three British Harriers are seen, the Hen Harrier is a regular winter visitor and is said to have bred. The Short-eared Owl is uncommon but may be flushed in winter from the sandhills of Greatstone or be seen flying about almost anywhere near the coast. All the Grey Geese occur on the Marsh in winter but never in large flocks such as are met with on the Norfolk coast. We have, however, once seen three species on one particular fleet, associated with a Goosander (a rare bird on the Marsh) and some hundreds of Shoveler and a few other species of Duck. Of game birds the Pheasant is an absentee and on Dungeness the Redleg is much commoner than the English Partridge.

The Marsh is ideal for Duck, and with luck eight to ten species may be seen in one day. The Shelduck is common in summer all along the coast, breeding in rabbit holes on the golf course and elsewhere; a few remain for the winter. The Mallard abounds everywhere and breeds freely. We have found seven nests at one time in a small reedy marsh perhaps three acres in extent. Teal are not common; Shoveler are often seen in large numbers on the spring migration, a few pairs of both species probably breed. The Garganey, common as a spring migrant, breeds on Cheyne Court and perhaps elsewhere. The Pintail is a winter visitor and spring migrant and may occur in small flocks. We have seen sixteen at one time. The Wigeon is common, Pochard occur in small flocks in winter and have also bred. All the other Diving Ducks are rare on the Marsh, doubtless because there is no deep water. In winter and still more on the spring and autumn migration the sea off the coast is covered with huge flocks of Common Scoter with which may almost always be seen some Velvet Scoter. Here also the Red-breasted Merganser is a regular visitor, whilst the Goosander, Scaup and Goldeneye are occasionally seen. We have never seen a Long-tailed Duck, Eider or Smew, although all three have been recorded.

The chief attraction of the Marsh is undoubtedly the Waders. The Lapwing, Redshank, Snipe and Ringed Plover are abundant at all seasons and nest freely in all suitable places. Some five or six pairs of Stone Curlew nest every summer on the shingle of Dungeness. Here also is found that chief glory of the Marsh, the Kentish Plover. Their main nesting area has recently been invaded by a light railway and the birds have been partly driven away but have found a new place where for the present the railway cannot follow them. There are only a few pairs and their chief enemy is man. Can one wonder that the poor fishermen collect their eggs when they can sell them at a high price. The end of

August and September, April and May are the best times for seeing other waders. On the shore may be seen flocks of Dunlin, Sanderling, Knot, Curlew, Whimbrel and Grey Plover. Golden Plover are more common on the inland marshes, they may be seen in large flocks on Greatstone Marsh associated especially at high tide with Grey Plover, Curlew, Whimbrel and other Waders. On the marshes may be seen the Common and the Green Sandpiper, the latter wintering in most years, whilst every winter a Purple Sandpiper comes to Littlestone sands. Not common but quite regular visitors both to the foreshore and to Greatstone Marsh are Turnstone, Godwits both Black- and Bar-tailed, Oyster Catcher (of which a few spend the winter and a pair has bred), Curlew Sandpiper, Ruff, Greenshank, Little and Temminck's Stints. The Spotted Redshank and the Avocet are rare but fairly regular. To give a general idea of the frequency of Waders, my son once saw sixteen species at Littlestone in about two hours, whilst Mr H. G. Alexander saw twenty-two species in one day between Rye and Dungeness.

Lastly, the sea birds. The Black-headed Gulls have nested in scores for many years in the reed beds of the Hoppen Pits. Four years ago they suddenly deserted their nests in mid-season and started laying on the surrounding shingle, it was suggested they were driven out by rats but the reason is really unknown. In the last two years they have mostly returned to the reed beds but some still nest on the shingle. In one nest we found this year were six eggs, differing in markings three and three, and evidently the product of two females. The two birds may have laid amicably at different times, but what will happen when they both try to incubate? If one female drives the other away, what will happen if the successful pair have six mouths to feed instead of the normal three? Eight years ago some twelve pairs of Herring Gull nested on the shingle: they have increased in numbers until this year there must have been a hundred pairs. Even more remarkable, on this same shingle nest some three or four pairs of Common Gull and in most years one or two pairs of Lesser Black-backs. Of other gulls, the Kittiwake is common off Dungeness in winter, especially during strong Easterly or South-west gales; the Iceland Gull is seen most winters, and we have once seen a Little Gull. The Common and the Little Terns are common in summer and nest in colonies on the Dungeness shingle. The Arctic Tern is common in spring and is said to have nested the last few years. The Sandwich and the Black Tern are passage migrants, so far as I can ascertain the former has never nested. The Arctic Skua is an autumn visitor and we have since seen a Great Skua. The Red-throated Diver is very common off shore all the winter, the Black-throated and the Great Northern Diver are regular but rare. Great Crested Grebes, Guillemots, and Razor-bills are very common, and we have also seen Red-necked Grebe, Little Auk and Puffin. These, like all the sea birds mentioned, are much more common during high winds, especially easterly gales. Finally, the one sad feature of this shore, the terrible number of dead and dying oiled birds. On January 5, 1930, on some five miles of shore from Littlestone to Dungeness we counted no less than forty Guillemots, of which eight were alive, two

Red-throated Divers, both alive; one Black-throated Diver, one Scoter, one Great Crested Grebe. and one Razorbill, alive. In closing this meagre account of the Romney Marsh and its Bird-life I would like to add that the Marsh, quite apart from its birds, is one of the most interesting, unique, and fairest places in this green land, even if one does not go so far as the Marsh folk, who would divide the world into five quarters. Europe, Asia, Africa, America, and the Romney Marsh.

A Few Notes on the Large Wood Wasp (*Sirex gigas*).

By ARTHUR RICHARDSON.

In January 1931, I had given to me, as a memento, a section (9 in. \times 7½ in., circumference 28 in.) of a branch of Cedar of Lebanon (*Cedrus Libani*) from the tree which stood opposite the old Tudor Palace at Enfield, now demolished.

The tree was supposed to have been planted in 1670 by Dr Uvedale (Master of Queen Elizabeth's Enfield Grammar School), from a shoot brought from Lebanon by one of his pupils.

In 1815, the tree at 18 inches from the ground was 15 feet 8 inches in circumference; in 1911, 22 feet.

The Cedar was felled in June 1928, and from inquiries I made, I found it lay about six months, was then sawn up, as there was no practical use for this timber.

The piece I have was placed in a room, and in the second week in July a *gigas* was found in the room, and another on the following day. I then investigated, wondering at the time where they could have come from. I then discovered that they had emerged from the section of Cedar. After this, observation was kept, and during the week six females and one male emerged. These I set and mounted.

The interesting part of the matter is, to me, that I had not known *gigas* to attack Cedar, and in my references for 100 years past I do not find Cedar mentioned once.

I made enquiries from sources where portions of the tree went, but no one appears to have noticed the *gigas*.

I was told that the men in sawing the timber up came across some larvae, and from the description given me I imagine they were *Sirex*.

I shall have the section under observation this summer to ascertain whether any further specimens emerge.

Some Structural Observations on the Waders (Scolopacidae)

And their Bearings on the Classification of the Family.

By G. CARMICHAEL LOW, M.A., M.D., F.R.C.P.

(Read before the Ornithological Section, 20th October 1931.)

THE natural order LIMICOLAE, now known as the CHARADRIIFORMES, is a very interesting one, including as it does among its numbers the plovers, snipe, sandpipers (waders), etc. There is no great unanimity as to the classification of the order, most ornithologists disagreeing with each other about this, but for practical working purposes we may adopt the classification I have used in my book, *The Literature of the Charadriiformes*. This is as follows:—

Order.	Sub-Order.	Families.	Sub-Families.
CHARADRIIFORMES.	OTI-LIMICOLAE.	{ Otididae. Burhinidae.	
	LIMICOLAE.	{ Scolopacidae.	{ Phalaropodinae. Tringinae. Calidritinae. Scolopacinae. Rostratulinae.
		{ Charadriidae.	{ Charadriinae. Vanellinae. Lobibyxinae. Haematopodinae. Recurvirostrinae. Peltohyatinae. Ibidorhynchinae. Arenariinae.
		{ Jacanidae.	
	LARI-LIMICOLAE.	{ Chionidae. Dromadidae. Glareolidae. Cursoriidae. Thinocoridae.	

Ten families, then, with thirteen sub-families are included under the order Charadriiformes.

I have included the Bustards, a family which has oscillated in and out of the group in different classifications, and at the other end have omitted the Gulls (LARIFORMES), though most modern workers include these. Some of the sub-families such as the PHALAROPODINAE, ROSTRATULINAE, HAEMATOPODINAE, and RECURVIROSTRINAE in my classification are now given family rank by some authorities, but we need not consider that here.

We are concerned in this paper with the sub-order LIMICOLAE, and of its different families, with the SCOLOPACIDAE. In the *Catalogue of*

the Birds of the British Museum, xxiv, 1896, Sharpe did not divide the Plovers from the Snipe and Sandpipers, but classified them all under one family, the CHARADRIIDAE, with different sub-families, his TOTANINAE (now TRINGINAE) and SCOLOPACINAE being the ones that interest us.

Subsequent workers have, however, agreed that the Sandpipers and Snipe are worthy to rank as a family of their own and the name SCOLOPACIDAE has been given to them. Three sub-families in the above concern us, the TRINGINAE, CALIDRITINAE, and SCOLOPACINAE, and it is these that I shall chiefly discuss.

It is comparatively easy to decide what genera to include in a family, or sub-family, but when it comes to the question of what species to include in a genus it is much more difficult. This is due to the fact that there are no definite characteristics or laws which govern the formation of a genus and so each individual is at liberty to include or omit whatever species he thinks fit.

Two schools have arisen, namely, those who put many species in one genus and those who practically make every species a genus—the so-called lumpers and splitters.

In studying where any individual bird is to be placed, we have to consider the following points:—

1. Osteology (study of the bones).
2. Bill and feet.
3. Myology (study of the muscles).
4. Anatomy of the alimentary system.
5. Plumage (feather pattern, colour, etc.).
6. Pterylography (study of the feather tracts).
7. Characteristics of young.
8. Eggs.

The following characteristics are found in the natural order CHARADRIIFORMES, as described by R. B. Sharpe, in part, in the catalogue of the Limicolae in the collection of the British Museum (1896). The Bustards, one must remember, are not included in his order LIMICOLAE, and many of the points noted here do not apply to them.

Osteology.

Palate: schizognathous.

Nostrils: schizorhinal (except in BURHINIDAE and genus *Pluvianus*).

Basipterygoid processes usually present (except in BURHINIDAE, CURSORIIDAE, and CHIONIDAE).

Cervical vertebrae: 15 (except in BURHINIDAE and JACANIDAE).

Coraco-humeral groove: distinct.

Furcula with hypocleidium.

Bill and Feet.

Bill: rhamphocaeca simple except in CHIONIDAE.

Feet: toes only partially webbed or not webbed at all; hind toe present in some, absent in others.

Myology.

Hallux, if present, connected with the flexor longus hallucis and never with the flexor perforans digitorum.

Anatomy of Alimentary System.

Loops of bowel typically peri-orthocœlous with four alternating loops; forms passing from this arrangement to the typically mesogœyrous.

(Peri-orthocœlous = second loop left-handed, open, and enclosing the third, which is generally straight and closed.)

Caeca usually large.

Plumage.

Oil gland tufted. After-shaft to contour feathers present. Primaries eleven, fifth secondary wanting, *e.g.*, aquincubital.

Retrices 10-28.

Pterylography.

Spinal feather tract well defined on the neck and forked on the upper body, with lateral bare tracts.

Characteristics of Young.

Covered with close and fluffy down; able to run shortly after being hatched.

Eggs.

Variable in colour, generally clay-brown, mottled or spotted or scribbled all over with black. White in *Dromas*.

The TRINGINAE (formerly TOTANINAE) is a well-marked sub-family and includes in its members the genera *Tringa* (Redshanks, Sandpipers, etc.), *Limosa*, the Godwits, *Numenius*, the Curlews and several other American waders. Some authorities would, however, separate the Godwits and Curlews into sub-families of their own, *viz.*, the LIMOSINAE and the NUMENIINAE.

The chief genus in the sub-family from our point of view is that of *Tringa*, formerly known as *Totanus*. This includes several of the Sandpipers, the Redshank, Greenshank and Yellowshank, the Common Sandpiper, Tattler, etc. It is a well-marked genus, the members having more acute and stiffer bills than those of the genus *Calidris*, which contains the other Sandpipers. There is no marked colour change in summer plumage and the young are striped.

The following species are included in the genus *Tringa*.

Sub-family TRINGINAE.

Genus *Tringa* = *Totanus*. Old nomenclature.

Species and sub-species:—

<i>Tringa ocropus ocropus</i> .	Green Sandpiper.
„ „ <i>assami</i> .	Eastern form.
„ <i>totanus totanus</i> .	Redshank.
„ „ <i>robusta</i> .	Iceland Redshank.
„ „ <i>eurhæmus</i> .	Ladak Redshank, C. Asia.
„ „ <i>terrignotæ</i> .	Eastern Redshank.
„ <i>erythropus</i> .	Dusky Redshank.

„	<i>nebularia nebularia.</i>	Greenshank.
„	„ <i>glottoides.</i>	Eastern Greenshank.
„	„ <i>georgi.</i>	New South Wales Greenshank.
„	<i>guttifer.</i>	Armstrong's Sandpiper.
„	<i>glareola glareola.</i>	Wood Sandpiper.
„	„ <i>picturata.</i>	Eastern Wood Sandpiper.
„	<i>hypoleucos.</i>	Common Sandpiper.
„	<i>macularia.</i>	American Spotted Sandpiper.
„	<i>stagnatilis stagnatilis.</i>	Marsh Sandpiper.
„	„ <i>addenda.</i>	Australian Marsh Sandpiper.
„	<i>melanoleuca.</i>	Greater Yellowshank, America.
„	<i>flavipes.</i>	Yellowshank or Yellow-legs.
„	<i>solitaria solitaria.</i>	American Solitary Sandpiper.
„	„ <i>cinnamomea.</i>	Western Solitary Sandpiper.
„	<i>incana.</i>	Wandering Tattler.
„	<i>brevipes.</i>	Grey-rumped Sandpiper.

The genera or sub-genera *Helodromas*, *Glottis*, *Pseudoglottis*, *Iliornis*, *Rhyacophilus*, *Actitis*, *Tringoides*, *Neoglottis*, *Heteractitis* and *Heteroscelus* are all included in the above.

NOTE.—*Ocrophus* is often written *ochropus*; according to strict rules, the former is correct.

Most of these species, however, have been given generic rank from time to time and many authorities still classify them so. These might rather be given sub-generic rank if one wishes to separate them. The name *Helodromas* has been applied to the Green Sandpiper (*Tringa ocrophus*) and there are some reasons for this separation as the bird possesses only a single pair of posterior emarginations on its sternum, in this respect resembling the Ruff. The bird also exhibits the peculiarity of laying its eggs in the deserted nests of other birds. The generic name *Glottis* has been given to the Greenshank, *Iliornis* to the Marsh Sandpiper, *Rhyacophilus* to the Wood Sandpiper, *Actitis* to the Common and Spotted Sandpipers, *Neoglottis* to the Yellow-legs, *Heteractitis* to the Grey-rumped Sandpiper and *Heteroscelus* to the Wandering Tattler.

As I have said, it depends on what constitutes a genus, and I think it is better to place all the members of the group under the genus *Tringa*.

The CALIDRITINAE (EROLIINAE of some, formerly TRINGINAE) is also a well-marked sub-family and includes in its members the genera *Calidris* (Sandpipers), *Philomachus* (the Ruff), *Limicola* (the Broad-billed Sandpiper), *Crocethia* (the Sanderling), and some other American genera.

The members of the genus *Calidris*, the chief genus in the family from our point of view, have blunt flexible bills. Most of the members assume a summer dress of chestnut or reddish-brown or black in part, and the young are spangled, not striped. The following are included in the genus:—

Genus *Calidris*.

Species and sub-species:—

<i>Calidris canutus canutus.</i>	The Knot.
„ „ <i>rogersi.</i>	Eastern Knot.
„ „ <i>rufa.</i>	American Knot.
„ <i>tenuirostris.</i>	The Great Knot.
„ <i>minuta.</i>	The Little Stint.

„	<i>ruficollis</i> .	Eastern Stint.
„	<i>subminuta</i> .	Long-toed Stint.
„	<i>minutilla</i> .	American Stint, or Least Sandpiper.
„	<i>temminckii</i> .	Temminck's Stint.
„	<i>maculata</i> .	American Pectoral Sandpiper.
„	<i>acuminata</i> .	Siberian Pectoral, or Sharp-tailed Sandpiper.
„	<i>bairdii</i> .	Baird's Sandpiper.
„	<i>fuscicollis</i> .	Bonaparte's or White-rumped Sandpiper.
„	<i>cooperi</i> .	Cooper's Sandpiper.
„	<i>maritima</i> <i>maritima</i> .	Purple Sandpiper.
„	„ <i>ptilocnemis</i> .	Pribilof Sandpiper.
„	„ <i>couesi</i> .	Aleutian Sandpiper.
„	<i>alpina</i> <i>alpina</i> .	The Dunlin.
„	„ <i>schinzii</i> .	Southern Dunlin.
„	„ <i>arctica</i> .	Greenland Dunlin.
„	„ <i>sakhalina</i> .	American Dunlin or Red-backed Sandpiper.
„	<i>testacea</i> <i>testacea</i> .	Curlew Sandpiper.
„	„ <i>chinensis</i> .	Eastern Curlew Sandpiper.

The genera or sub-genera *Pisobia*, *Neopisobia*, *Limonites*, *Leimonites*, *Heteropygia*, *Limnocinclus*, *Actodromas*, *Arquatella*, *Pelidna* and *Ancylochilus* are all included in the above.

A point of some importance arises here, and that is whether the Knot should be considered generically the same as the other members of the genus, and there is considerable difference of opinion on this point. This species is a large CALIDRITINE with straight and rather stout bill, longer than the tarsus, and having a tail with the middle retrices not projecting. The tail also is less than $\frac{2}{5}$ ths as long as the wing. The young, though spangled, differ to a certain extent from the young of the other members. Personally, I do not think there is enough to separate it, thus agreeing with Hartert, Witherby, and others. If this is so, then *Calidris* becomes the name of the genus and CALIDRITINAE the name of the sub-family. On the other hand if we do separate it, the name EROLINAE will have to be used for the sub-family with the generic name *Erolia* for the other species grouped in this genus.

Just as in the case of the genus *Tringa*, many of the species of the genus *Calidris* have been given generic rank from time to time and the Americans still keep many of these up.

The generic name *Pisobia* has been given to the Stints, *Pelidna* to the Dunlin, *Heteropygia* to Baird's Sandpiper, *Arquatella* to the Purple Sandpiper, *Ancylochilus* to the Curlew Sandpiper, etc.

I think it is best to group all these different genera into the one, namely *Calidris*.

Here are some of the points that are used to separate some of the different members of the genus.

The Dunlin has a mobile tip to its beak, like the Woodcock and Snipe, the bill is longer than the tarsus, faintly decurved distally, compressed, not dilated; middle toe with claw $\frac{4}{5}$ ths as long as tarsus.

In *Calidris testacea*, the Curlew Sandpiper, the bill is distinctly decurved distally, longer than tarsus, while its middle toe, with claw, is less than $\frac{3}{4}$ ths as long as tarsus.

In *Calidris maritima*, the Purple Sandpiper, the bill is stouter. All the members have a hind toe. The Sanderling, not having this, is placed in a genus of its own.

Dr P. R. Lowe, in a very valuable paper, entitled "Studies on the Charadriiformes: I. On the systematic position of the Ruff (*Machetes pugnax*) and the Semi-palmated Sandpiper (*Ereunetes pusillus*) together with a review of some osteological characters which differentiate the Erolinae (Dunlin group) from the Tringinae (Redshank group)," *Ibis*, 1915, pp. 609-616, 2 text figs., gives a series of osteological distinctions between the CALIDRITINAE and the TRINGINAE. As these may not be available to all, I think I may give a synopsis of them here, as it will call attention to the matter again and stimulate those anatomically inclined to consult the paper in the original.

CALIDRITINAE.

Premaxillæ.

Distal end flattened and slightly spatulate; foveated or pitted area at anterior end of premaxilla very restricted; foveae circular or oval.

Palatines.

External and posterior margins of the palatal plates at their junction form almost a right angle, the actual angle being somewhat rounded off.

Pterygoid processes of palatal plates short, thick and conspicuously divergent.

Maxillo-Palatine Process.

Completely fused with the pre-palatal portion of the palatal plate of either side as a thin elongate plate with parallel internal borders devoid of sculpturing.

Lacrymals.

Differ especially as regards their descending processes.

Grooves for Supra-Orbital Glands.

Difficult to make out.

Tested by osteological characters the following come into the sub-family CALIDRITINAE:

C. alpina alpina.

C. minuta.

C. maritima.

C. testacea.

C. maculata.

Calidris canutus (Knot).

Ereunetes pusillus.

Micropalama himantopus.

Eurynorhynchus pygmeus.

Philomachus pugnax.

TRINGINAE.

Premaxillæ.

Distal ends more elongated or pointed; foveae slit-like or elongate depressions.

Palatines.

Postero-external angle of palatal plate obtuse.

Pterygoid processes long and ribbon-shaped and towards the pterygoid articulation tend to be more parallel.

Maxillo-Palatine Processes.

Extend backwards on either side of the vomer as a very much attenuated pear-shaped or sac-like process, which is free throughout the greater part of its course.

Lacrymals.

Grooves for Supra-Orbital Glands.

Marginal and quite conspicuous.

Tested by osteological characters the following come into the sub-family TRINGINAE:

T. ocropus.

T. solitaria.

T. hypoleucos.

T. macularia.

T. glareola.

T. calidris.

T. flavipes.

T. nebularia.

T. stagnatalis.

The sub-family SCOLOPACINAE includes the Woodcock and Snipe, a very well-defined group.

There are no seasonal variations in plumage, the sexes are alike and the young hardly differ from the adults.

In the Snipe and Woodcock there is extreme shortening of the base of the skull, which has tilted the floor upwards so that the cerebrum, instead of lying in front of the cerebellum, lies above it, *i.e.*, the long axis of the brain instead of running parallel with the long axis of the skull runs at right angles to it. This bending downwards and forwards of the brain cavity has caused the orifice of the ear to move forwards so that in the Snipe it lies below the eye, while in the Woodcock it has shifted still further forward and lies in front of and below the eye.

The tip of the upper part of the beak (the upper mandible) is extremely flexible or mobile and can be raised up and brought down again on the lower mandible independently, thereby forming a grasping organ of great sensibility (Woodcock and Snipe). Worms are grasped as in a pair of forceps and drawn out. The beak also contains sense organs of touch of extreme sensitiveness.

The Common Snipe has fourteen tail feathers, the Great Snipe sixteen (white outer tail feathers).

The Jack Snipe is placed in a genus of its own because the sternum has two notches, while all the other Snipe and Woodcock have only one. The syrinx, according to Pycraft, is formed of a number of fused tracheal rings of gradually increasing circumference, giving the end of the trachea a trumpet shape. Interposed between these fused elements and the first bronchial semi-ring is a free semi-ring, partly cartilaginous; attached to its ventral end is a lingulate plate of cartilage, the free end of which is attached to the ventral end of the first bronchial semi-ring. This is an unique condition. The eggs are very large in proportion to the size of the bird, usually four in number.

I have not included the Painted Snipe, *Rostratula*, here as it is not a true Snipe and is now placed by most authorities in a family of its own, the ROSTRATULIDAE.

These technical details are necessary for a proper understanding of the subject, and I would impress upon all young ornithologists beginning their career that they should study the anatomy of an ornithological species first, just as the young medical does the human species, so that they may get a proper grasp of the essential points of the group they are studying. Without this, classification is meaningless and though an enormous amount of work has already been done by the old ornithologists on anatomy, yet much remains still to be done and there is plenty of scope for interesting research.

Notes on the Coots on Fetcham Pond, 1931

By H. J. BURKILL, M.A., F.R.G.S.

Read to the Society, 5th January 1932.

I pass the side of the Mill Pond at Fetcham four or five mornings a week, and in the summer I return home again past the pond nearly every evening, so that I am in a position to make an almost daily record of the place.

I frequently count one or more species of the birds, but as a portion of the pond is margined by a belt of tall grasses some birds may often be overlooked. Also the island in the middle hides a part of the view and is heavily fringed with willows. Consequently my figures can be taken as below the average numbers, owing to the possibility of some birds being hidden among the plants.

The water birds are Coot (*Fulica a. atra* L.), Little Grebe (*Podiceps r. ruficollis* Pall.), Moorhens (*Gallinula c. chloropus* L.), and Swans (*Cygnus olor* Gm.), with, in stormy weather, a few Black-headed Gulls (*Larus r. ridibundus* L.).

COOTS.

The number of these fluctuates from time to time and seems to rise somewhat in the winter, with a considerable reduction when mating has taken place, as if unpaired birds leave to seek other quarters, or it may be that some pairs migrate elsewhere. Am I right in suggesting that Coots do not mate until nearly two years old? and that the unpaired birds are mostly the previous year's broods?

The lowest count I made was 19 birds on 13th April, and the highest was 53 on 30th December, though on 11th September there were 40 old and 10 young to be seen. Five counts in December averaged just over 47 per day.

On 14th February I noticed the males showing off their plumage in front of the females.

On 3rd March a pair which I will call pair "A" began to build No. 1 nest, but they never used it, and on 18th March were building No. 2 a few yards away, where they hatched out 2 young.

Pair "B" built No. 3 on 25th March, but dismantled it, using the materials to construct No. 4, where 2 young were hatched out early in May. The hen laid again, and on 2nd June I saw three or four red heads poking out of the nest. On 19th June she had 5 young by the nest, her second brood. On 7th July the hen was sitting again on this nest, and she continued to use it up to 27th July.

On 15th July we had very heavy rain in the early hours; more rain on 16th, and again in the afternoon of the 17th. On 16th and 17th mornings the hen was observed building up the nest until she had raised it to three times its previous height. On 18th the level of the water

had risen to the level of the bank on the west side. The water supply comes from springs at the foot of the chalk, and its outlet is controlled by Mr Mizen, who uses it for his watercress beds. After this "high tide" the nest was reduced again in size, unless it had sunk in the water.

The young of the third brood were hatched about 20th July, as on 23rd the parent was standing on the nest with three sizes of young, *i.e.*, the May, the June, and the July broods. I was not able to see more than two of the last lot, and I never found out whether there were more. The nest was close to the island and the birds used to swim about under the willows there.

Pair "C" built No. 5 nest early in May, but did not sit. They then built No. 10 on 21st May, but though they sat I never saw any young.

Pair "D" built No. 6 in May and hatched one chick.

Pair "E" built half a nest on a floating log (No. 7) and then removed the materials a short distance away, where they built No. 8 but failed to produce any young.

Pair "F" built No. 9 in May, too far out in the middle of the pond for me to observe clearly, but I never saw any young near it.

Thus 6 pairs built 10 nests, 4 of them being of little use. The 6 that were used hatched out altogether 12 young, of which 9 came from one nest in the three broods. No other bird had more than one brood, or seemed to sit after her first effort.

In 1930 there were 6 nests with 15 young.

Some Preliminary Remarks on Brambles.

By R. W. ROBBINS.

NO English wild plant can be more generally known than the bramble, or, popularly, the blackberry. Even the least observant recognise at once the tangle of tough prickly encroaching stems, with elegant leaves, the sprays of smallish rosacean white or pink blossoms, and particularly the clusters of black and tasty fruit. Linnaeus' *Rubus fruticosus* is one of our most obvious plants, thrusting itself into notice in every hedgerow, wood or common. His description is: *Rubus foliis quinato-digitatis ternatisque, caule petiolisque aculeatis*, that is, the *Rubus* with five fingered and ternate leaves and prickly stems and leafstalks—a plant readily recognisable and distinguished from its near relative, the raspberry, by the form of the leaves (palmate instead of pinnate, both pairs *c^f* leaflets arising from the same point) and the colour of the ripe fruit, which in the raspberry readily separates from the receptacle and in the blackberry does not.

Upon a little acquaintance with the bramble we quickly realise that *Rubus fruticosus* is a very variable plant. The blackberry gatherers from town are soon aware that some bushes yield large juicy well-

flavoured fruit, while that of others is acid, or small, dry and worthless. When we examine the stems we may find them smooth and shining with widely spaced prickles, or hairy, downy or bristly, sometimes thickly beset, with prickles long or short, hooked or straight, broad based or needle-like, similar or various. Flowers may be handsome and cup-like, with large broad petals, or starry, or narrow-petalled and meagre, white, lilac, and all shades of pink to deep rose. The panicles of flowers and fruit are small or large, compact or long-pedicelled and spreading, cylindrical, pyramidal or irregular. The leaves, while retaining their palmate or ternate form, are glabrous or hairy, or even velvety beneath, finely or coarsely toothed, the leaflets ranging from lanceolate to circular, long or short-stalked, sometimes pale or white beneath, deciduous or persistent in winter. The plants themselves vary from tall, high-arching stems, keeping always in the air, to low, creeping, and trailing shoots which end by rooting in the soil.

When we have observed and fixed certain distinctive characters in a particular bramble, it is usually not long before, with pleasurable recognition, we come across the same grouping of characters in another plant, and frequently we shall find several similar plants in the same neighbourhood. Where rooted runners give rise to new plants, it is obvious that they will have the same characteristics, being merely extensions of the original plant. But our bushes may be on both sides of a broad road or some such barrier, and, if we have the patience to raise seedlings, we shall usually find in the offspring the same characters as in the parent.

A careful examination of the brambles of a given district will establish the existence of a number of separable forms distributed over the area, but it is certainly true that if another area twenty or thirty miles away be similarly studied, a considerable proportion of the forms will be new, and this is particularly so if the soil and type of country are different. Thus it has arisen that the number of forms named and described by English and foreign botanists runs literally into hundreds, and, as might be expected, synonyms are plentiful.

The questions naturally arise—What are these forms? Have they any real claim to be considered species? Or are they merely variations due to soil, aspect or climate, spreading within limited areas but possessing little permanence under altered conditions? The latter question can be answered with some conviction. Sufficient experimental work has been done in raising forms from seed to show that in many cases they are, as far as we can judge, permanent; and, although variations of moisture or dryness, shade or exposure may induce more or less hairiness, greater or less luxuriance of foliage and development of panicle, if the plant continues to thrive and produce fruit, the distinctive characters of the form are rarely so masked as to prevent identification. The conditional “if” is important, for an ill-grown unhealthy plant will develop abnormalities, and sun-loving forms rarely flourish in the shade, and vice-versa. The clearance of an area of woodland soon brings about a change in the bramble population, not so much by modification of the old plants as by the introduction of new forms which

in time will supplant them. It is true that experiments carried out in Vermont with certain forms of American Rubi have shown that in these forms prickles, hairs and glandular development are greatly increased by full exposure to light, and diminished almost to vanishing point by shade. It is difficult to believe that this result has a general application, for in England the shade forms in general tend to produce abundance of hairs, glands and prickles of various kinds, while a large proportion of the sun-loving plants have stems more or less glabrous, with simple prickles often widely spaced.

But when we come to consider whether these forms are worthy of specific rank, we are up against the old problem of "What is a species?" Of the close relationship of British brambles there can be little doubt, and a common ancestor not very far back in evolutionary history can be justly surmised. Intermediates are only too common and give a vast deal of trouble to the student. But it is a remarkable fact that many of those plants which show a mixture of characters of two well-defined forms are more or less sterile, sometimes completely so. Such plants have the aspect of true hybrids. The forms which they connect can generally be found near at hand, and, in addition to their sterility, they are usually rampant growers with vigorous and often abnormal floral development. There is such a plant in a hedge near Oxted, intermediate between *R. rusticanus* and *R. dumetorum*, which by means of its long, rooting branches has filled the hedge for 20 or 30 yards. It bears masses of bloom, but in the late summer the hedge is fringed with the withered panicles without a vestige of fruit. If, then, this plant and others like it are really hybrids, the parents have a fair claim to represent true species, since the sterility of crosses between distinct species is a common phenomenon in plants as well as in the animal kingdom.

If, however, we admit the claims of some of the brambles to rank as species, it is certain that not all the forms described as specific are equally valid. Complete sterility may arise from non-development or malformation of the ovules, but hybridity affects both sexes, and it is significant that the pollen grains of brambles are so often partially imperfect. Dr Focke, the famous German batologist, found only three British Rubi which had "quite regular pollen grains"—*R. caesius*, the Dewberry, a Linnean species; *R. rusticanus*, very well known and widespread, and *R. gratus*, perhaps the largest flowered and fruited species. At the same time it would be absurd to say that these three alone are species and all the others are forms derived from them. Very plainly it is not so, though there is possibly more ground for the suggestion that they are the only forms which have fully attained the stage of development and degree of stability which we are accustomed to associate with a species.

There are a number of others, however, that are not far off that stage. In Druce's *British Plant List*, 24 hybrid brambles are admitted, *rusticanus* being a constituent of 10, *caesius* of 4, and *gratus* of one only. Nine have a very well-marked form, *R. leucostachys*, as one of the parents, and there are 18 other parent forms involved. A plant sufficiently distinctive to be recognised as a constituent of a natural hybrid

has gone some way towards the status of a species. It is evidently a question of degree, and it becomes well-nigh impossible to say where to draw the line. The present solution seems to be to call all separable, fertile, and apparently fixed forms "micro-species," and leave it at that.

Linnaeus' old *Rubus fruticosus* thus becomes a large and complex group, the FRUTESCENTES or EU-BATI (true brambles) group of the genus *Rubus*. In Moyle Rogers' *Handbook* of 1900, 100 of these micro-species are described as British, with 69 varieties and sub-species. The *London Catalogue*, ed. xi (1925), admits 119 species, and Druce's *British Plant List* (1928) 152, excluding aliens, with 95 varieties; further additions are still being made. As regards distribution, although some few are only known from a single area (10 in a single county only), the great number are fairly widespread, not only over Britain, but in the neighbouring parts of Western Europe. Some are northern, some southern, some western or Atlantic. They are, generally speaking, lowland plants but some species, even groups of species, prefer hilly country. Seventeen have been recorded from more than half of the 112 botanical counties of Great Britain, and 45 are recorded from 30 or more counties. *Rubus caesius*, in 82 counties, is one of the most widely spread, but it is beaten by *R. Selmeri* (86) and *R. pulcherrimus* (84), while three others appear in 80 or more.

The impression one gains from the study of British brambles, and which I have tried to convey, is that of a genus of plants in an active stage of evolution. Forms are arising, modifying, fusing and vanishing, as it were before one's eyes. The stable, clear-cut group we call a species here seems to be out of focus, to fade into other groups and trail away into forms and variations. Brambles very seldom possess that useful, single "diagnostic character." A combination of characters must be considered and weighed before the species can be determined, and although this seems to exasperate some botanists, to others it is, one may say, part of the fun. To these there is an undeniable fascination in the study of this complex and baffling but vigorously live group.

How does one set about the identification of brambles? The bramble has a perennial rootstock and more or less woody stems, which, however, are rarely more than biennial. New stems arise from the root each year, and the following year they bear fruiting branches springing from the axils in the higher part of the stem, which frequently has rooted at the tip. After fruiting the stem usually dies, but, unless broken away, remains to form part of the bush, eventually a tangled impenetrable mass. The habit of growth is usually characteristic of groups—upright or high climbing and arching, low arching, or trailing, all resulting in bushes of widely varying appearance. Here begin the difficulties of the collector. Brambles commonly grow in company, thus distorting their individual form. Moreover, as it will be necessary to take the flowering panicle from last year's stem, together with a portion of the stem and leaves of the year, where plants are intermingled it is often astonishingly difficult to be sure we have both from the same root. Isolated plants should be selected if possible, and where there is any doubt whatever the bushes had better be left alone.

Having noted the general habit, a typical flowering panicle is cut, if with some young fruit so much the better. A single petal is preserved in its natural form on a scrap of stamp paper. The colour of the petals is noted, and of the stamens and styles, also their relative length. These details are apt to be lost in the dried specimen. A couple of pieces of the stem of the year, each with a fully developed and typical leaf, complete the specimen. Other details which can be noted from the living bush are the character of branching, the tone of colour of the leaves and the prickles near the base of the stem. The leaves of the flowering branch sometimes differ from those of the stem.

To run our plant down, we first examine the stem, its shape in section, and its clothing of bloom (wax), down, felt, hairs, bristles, glands sessile and stalked, tubercles, acicles, pricklets, and prickles. The classification is largely founded on the form of the stem and prickles, and the absence or presence in greater or less degree of the various other structures carried by the stem and known in general as the armament. The form and armament of the panicle is also important for fixing the group, and further clues may be obtained from the shape of the sepals, their direction in flower and fruit, the form of the flower and shape of the petals, and the length of stalk of the central leaflet and the basal pair. Form, texture, covering and serration of the leaves, the colours of the floral parts, and characters associated with the fruit, are often specific once the group has been decided, but the final determination rests on a judicial survey of the whole, a summing up and weighing which may be difficult, but is, nevertheless, an attractive mental exercise for quiet winter evenings.

A convenient guide to British brambles is Rev. Moyle Rogers' *Handbook of British Rubi*, published in 1900. Much has since been published in the *Journal of Botany*, the *Reports of the Botanical Exchange Club*, and elsewhere, without greatly modifying the classification of the *Handbook*. Here the brambles (FRUTESCENTES) are divided into fourteen groups, the first having the simplest armament and form of panicle. The armament becomes progressively more complex until the 12th group (KOEHLERIANI) where it reaches its highest development. The 14th group consists of allies of the Linnean species *R. caesius*, the Dewberry, and the 13th is in the nature of a connecting link.

To fix the group to which our specimen should be referred is often the hardest part of our task. There are so many points to consider, so much referring back and forth, that one is apt to overlook a character that may quite alter the position. The table which follows is offered in the hope that it may do something to lessen this difficulty. It has been drawn up with some care, and although, no doubt, imperfect, it has the advantage of bringing most of the important differentiating characters under the eye at one time. Perhaps it may help some young botanist in starting a study which will yield him much interest and pleasure in time to come.

VESTITI: Most of this group have leaves very softly hairy beneath.

EGREGII: A mixed "omnibus" group of glandular species.

RADULAE: Sub-equal large prickles, small glands and acicles, without intermediate armament.

SUB-BELLARDIANI: Large prickles less strong and more scattered than group 10.

KOEHLERIANI: Stout plants, with very mixed and abundant armament.

BELLARDIANI: Usually small, slender plants of woodland habitats.

CAESII: Large "solid" looking flowers, with broad, round, overlapping petals.

A NOTE ON APHIDS.

Forda formicaria Heyden was observed at Fetcham, Surrey, on the roots of *Sonchus oleraceus* L. and *Crepis virens* L., the latter being a host plant that is not mentioned in T. V. Theobald's list for the species.

On 24th October, after three nights of sharp frost, large numbers of *Pterochlorus saligna* Gmel. (*Lachnus viminalis* Pass.) were seen on the trunks and branches of *Salix purpurea* L. With them were some wasps, apparently trying, though very drowsy, to feed upon the sweet juices given off by the Aphids.

H. J. BURKILL.

STRANGALIA AURULENTA F. (COL.) AND SARGUS BIPUNCTATUS (DIPT.) IN CORNWALL.

The Cerambycid beetle, *Strangalia aurulenta* F., again occurred in my garden at Tresillian, near Truro, this year in some numbers. Among the Diptera taken in the garden was a fine female of *Sargus bipunctatus* Scop., a handsome fly, of which the male is entirely green while the female is orange and purple-blue with a bright green thorax.

C. NICHOLSON.

Ongar Castle.

By W. C. FORSTER.

These notes are an amplification of those which I made for the visit of the Archaeological Section to the castle last summer.

The collection of the information has been more than usually interesting, because of the great contradictions I have found in the various books I have consulted on the matter. This is mainly because, since the end of the last century, expert opinion with regard to the dates of the early Norman castles has changed. It used to be considered that many of such castles had been originally erected by the Saxons and adapted by the Normans; now it is held that they were entirely built by the Normans and that the Saxons were but poor earthworkers; that, as a matter of fact, they trusted little to walls or ramparts, and that their strength, after they had settled in the country, lay neither in earth or stone work but in the boundary of woods or marsh that extended round their settlements. Chipping Ongar is probably an example of this.

The map is reproduced, by permission of H.M. Stationery Office, from the "Historical Monuments" of Essex, Volume II., and the letters and figures in my article refer to it. I should like to call attention to the orientation of the map. The north, instead of being, as usual, on the top of the map, is on the left hand side where the west generally is.

Ongar Castle is in Chipping Ongar, and the name is very significant; Chipping is a well-known Saxon word meaning market, and Ongar another Saxon word meaning a wooded slope. The town is situated at the foot of the slope and the castle on the higher ground above it. The slope is a spur which juts into what was originally a marsh, between the Roding and the Cripsey, at a point just above where they meet. The spot would thus be very suitable for a Saxon settlement, as it was defended by the marsh on most sides, also by a steep escarpment just to the right of where the church now is (see map) and the only side that would require fortification was that at the top of the spur, that is on the north east, and here there are indications of earthworks, near the ponds at the top of the map, which may very well be the remains of defences put up by the Saxons.

It has been contended that some of the earthworks may be Roman. but this, I think, is unlikely. The Roman road was, at its nearest point to the castle, some two miles away and on the other side of the Cripsey. A good many Roman tiles have been found in the sides of the gateway (5) in the inner bailey of the castle, and also the walls of the church contain a large number of them. However, Roman tiles, not in situ, that is reused tiles, are no dependable evidence of the existence of the Roman occupation of the area where these reused tiles are found. They might have been brought there. Several of the Norman churches near Ongar have many Roman tiles in their walls. This is, of course, evidence that there must have been an abundant supply of these tiles some-

where, but there is no evidence, that I know of, that that place was Ongar. In one of the books I have been reading lately it is stated that in 1767, in a field between Ongar and Fyfield, several Roman urns, coffins, tiles and skeletons were found. So that may have been the place where the tiles came from.

Essex, as is well known, is poor in pre-historic earthworks. There are none until the late Iron Age, that is, just pre-Roman, and these earthworks are on relatively high ground, e.g., Loughton and Ambresbury. There would appear to be no reason why the Britons should have made a settlement at Ongar, but, for the two reasons I have already stated: (a) the name Chipping Ongar, and (b) the marshy ground, it is quite probable that the Saxons did, and that it was then a market place of some importance.

After the Conquest the manor of Ongar was held by Eustace, Earl of Boulogne, together with several adjacent manors. He appears to have had his main castle at one of the other manors, Stanford Rivers, and probably did not do much in the building line at Ongar, though possibly he strengthened some of the Saxon defences, which probably were not strong. The estate descended to his third son, whose daughter brought it in marriage to her husband Stephen, Earl of Blois, afterwards Stephen, King of England; and Stephen's son, about 1150, gave the manor to Richard de Lucy, who also had the grant of several adjacent manors, and it is he, it is generally considered, who developed the existing defences of Ongar, and built the main castle, that is the mound and inner bailey (1 and 2 on the map), the earthworks of which still remain.

He was a very important man. The Plantagenet Kings, to curb the power of the Norman knights, used to side with the people, the Saxons. Richard de Lucy was a Saxon and Henry II. made use of him for this purpose. He was Sheriff of Essex, Justiciary of England, and Lord Lieutenant of the Kingdom, during the absence of Henry II. in Normandy in 1166. In 1179 he retired to the Abbey at Lesnes, which he had founded, and there died the same year.

The castle de Lucy built at Ongar is noteworthy as being a very characteristic example of the mound and bailey type, with town enclosure, or burgh, attached, a type which was introduced into England by the Normans. At the time of the Conquest there were five such castles, which had been built by Edward the Confessor's Norman favourites. After the Conquest a very large number of them were erected, notably during the reign of Stephen.

The ramparts of the inner bailey and mound of Ongar castle are in an exceptionally good state of preservation, probably for two reasons: (a) they were not thrown up until nearly 100 years after the Conquest, when presumably the art of making such defences had improved, and (b) the material used, a chalky boulder clay and gravelly sand, a combination forming, when rammed in a moist condition, almost a natural cement, sufficient to account for the resistance of the ramparts to the action of the weather, so, although both the mound and ramparts of the inner bailey are covered with trees and dense undergrowth, they are

otherwise in excellent condition. The material used accounts also for the ramparts being much more precipitous than was usually the case.

Beyond, to the west of the inner bailey, there was the town enclosure (3) which also had ramparts and ditches, traces of which still remain, though most of them have been obliterated by the buildings of the present town. These ramparts were presumably in existence before the time of de Lucy and were not so well made as those of the inner bailey. The town enclosure rampart, which joined that of the inner bailey at (6) originally extended as far as the Cripsey and there was a return rampart, from the Cripsey, to a point where the road to the right of the church now is. This road is on the top of a steep escarpment, which would have needed but little further fortification.

Then again to the north there was another enclosure (4), traces of which can be seen on the north side of the mound, and, again, to the east there are traces of a still further enclosure.

To return to the mound and inner bailey, on the west side of the latter there was a gateway, see gap in the plan at (5), which led into the town enclosure; portions of the sides of this gateway, composed of flint rubble and Roman tiles, still remain. This bailey is about two acres in extent. The rampart, presumably, was surmounted by a wooden palisade and was further protected by its outer moat. The measurements of the ramparts, moats, etc., are given in the map A.B.C.

The mound (1) has a diameter of about 230 feet at the base, and 75 feet at the top. There are no traces of any bridge crossing the moat. Presumably, in de Lucy's day, there was none. Access to the mound would have been by wooden steps reaching from the bailey to the top of the mound, which could be moved in time of danger. There are several illustrations of the kind of steps then used in existence. Later, however, there was probably a bridge of some kind, possibly at a point near where the present farmhouse now is (7). There would have been a wooden palisade encircling the top of the mound, and a wooden building, probably a tower, in the centre, where de Lucy and his family would have lived and which in time of danger would have been their last retreat.

In the inner bailey would have been wooden buildings for the accommodation of the soldiers, and the town would of course have been in the town enclosure.

It was a long time before, in the smaller castles at any rate, timber buildings were replaced by stone ones. Early Norman castles, consisting only of earth and timber, could be constructed in a very short time. One of the reasons why the buildings at the top of the mound would originally have been of timber was because the mound was usually artificial, being made of the material taken from the moat, so the foundations for sometime would not have been strong enough to support anything more substantial than wood.

The mound and bailey type of castle was very useful to the Normans. The mound was the inner place of safety, if the castle was attacked by an outside enemy, and it was also the means of defending the castle

from inside enemies. Norman castles were built by Norman knights in places inhabited by a conquered race, the Saxons.

The de Lucy family did not long retain the manor, and it subsequently passed through several hands, reverting, as was so common in Mediaeval times, frequently to the Crown.

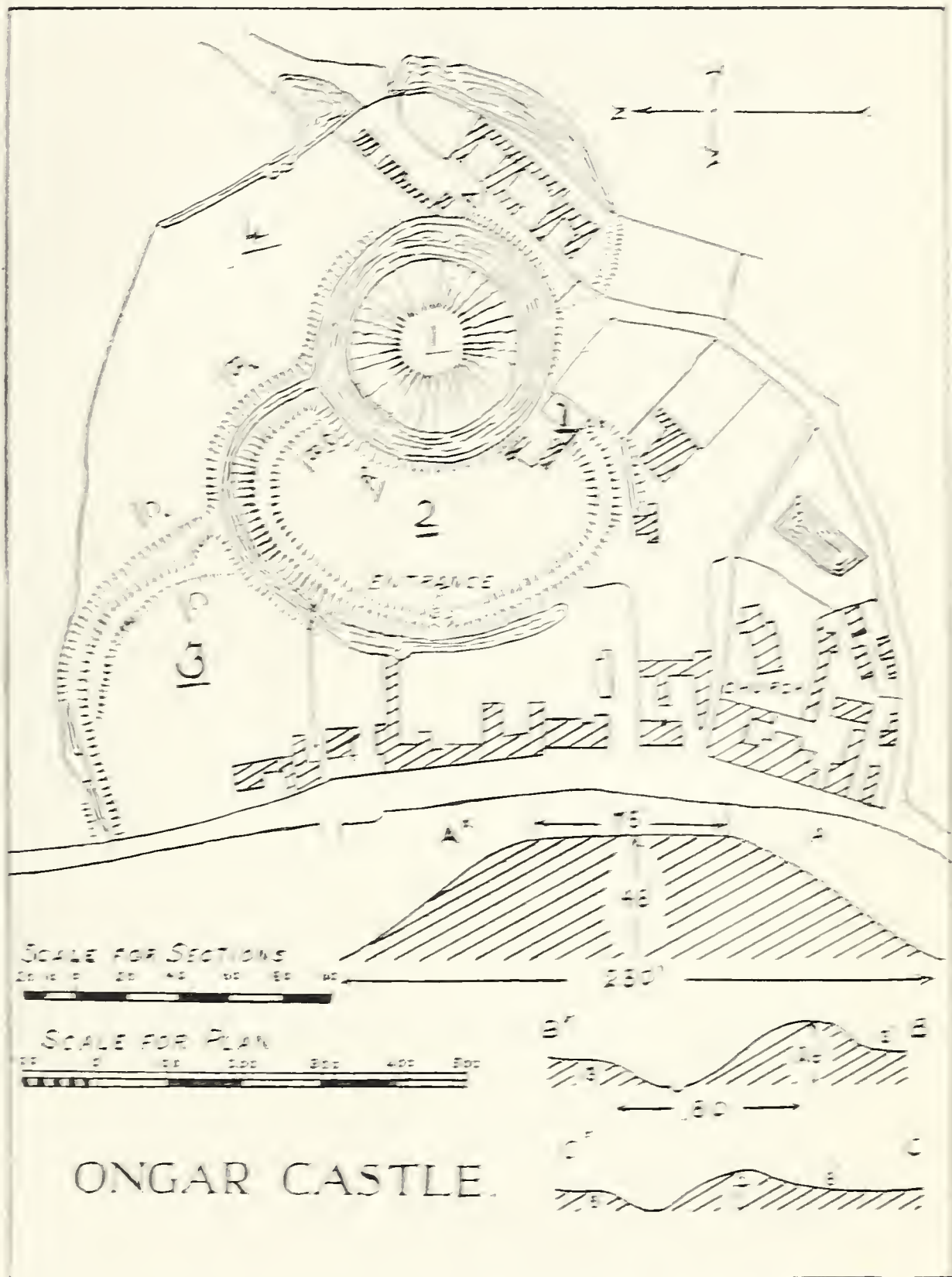
The mound still retains traces of there having been stone buildings erected upon it, but as to what these were and when they were put up there is no evidence. Possibly, a stone shell keep may have replaced the wooden palisade, with a stone built residence in the centre for the lord of the manor. In the 13th century, when England had become more settled, it was usual for the lord of the manor to move his quarters on the mound to stone built ones in the inner bailey, and, as there are some traces of stone buildings in the inner bailey here, this may have been the case at Ongar.

This, however, is very conjectural. It is recorded that in the 16th century whatever buildings then existed on the mound were pulled down and a three-storeyed brick-built mansion, said to command extensive views of the surrounding country, erected in their place. This work was done by the then lord of the manor, William Morice.

It was in this building that Queen Elizabeth was entertained by W. Morice's widow in 1579. On the 9th August of that year the Queen left Havering and stayed the night at Ongar, a distance of six miles. The next day she continued her progress and slept at Rookwood House, a distance of about five miles. During this particular progress she seldomed travelled more than ten miles a day. These short journeys, and consequent frequent stops, possibly give some plausibility to the claim as to the great number of houses in which the Queen is said to have slept.

In 1744 this Tudor house was pulled down and a summer house erected on its site, traces of which still remain. The top of the mound has never been thoroughly excavated so it is impossible to say exactly what was there. For many years the mound has been an island, without any easy means of crossing the moat. During the war a cave was dug in it for military purposes.

I have not been able to obtain much information about the present farm house (7). No mention is made of it in the "Historical Monuments," but they do not contain descriptions of buildings later than 1744, the date when the Tudor house was pulled down. I understand, however, that the farmhouse was built of the materials of the Tudor house and contains some Tudor panelling.



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BRITISH
MUSEUM

1 SEP 32

NATURAL
HISTORY.

Archæological Inspections, 1931.

By G. J. B. Fox.

SHERE CHURCH (ST JAMES) (Visited 11th April 1931).

THE village, situated in the valley of the Tillingbourne, is one of the beauty spots in Surrey; its name appears in various forms, among the earliest being *Essira* (D. Bk.) and *Schyre* (XIIIc.); there were various manors, one, *Shiere Vachery*, being held by the Bray family. The present church dates from the Norman period (work of that date is seen in the tower and in the south doorway); it is mentioned in the *Domesday Book*; it is built of Bargate stone, ironstone, flints, and perhaps material from the Roman settlement on Farley Heath; it has been restored, but has escaped drastic treatment; the original cruciform plan included chancel, tower with apsidal transepts, and nave; to-day there are chancel with south or Lady Chapel, tower with north transeptal recess, nave with south aisle, west and south porches, and modern vestries on north side of nave; (see Mr P. M. Johnston's plan in *V.C.H.*, ii, p. 434). The advowson was granted to Netley Abbey by Roger de Clare in 1243 (confirmed by Henry III in 1251); to that Abbey are probably due the XIII/XIVc. features in the church.

The Exterior. At north west angle is a large tapering buttress of brick, XVIIIc.; an anchorite cell formerly between the east buttress of the north recess and the buttress on the north wall of the choir has been destroyed; (in the XIVc. Christina, daughter of William the Carpenter, was licensed to dwell as an anchoress in the churchyard); at the east end are contemporary diagonal buttresses; on the south side the head of an original buttress is shown below the string below the bell-chamber; there are two buttresses at the south-east angle of the Lady Chapel; west of the eastmost window in the south wall is a flat buttress with mass-dials, marking the chord of the transept apse; further west is another marking the south west angle of the transept; rafter ends with a roll set in a hollow remain under the eaves; west of the porch are stone steps to the doorway of the gallery; at the south-west angle are two contemporary buttresses; now only the aisle is roofed with Horsham slabs; at the west end is a buttress in line with the south arcade.

The Chancel was rebuilt XIII/XIVc. (later than the Lady Chapel), probably at the instance of Netley Abbey; originally it may have been apsidal, as curved stones were reused; the east window is similar to, and a little later than, that in the Lady Chapel; it has three-lights, the central is wider and has a quatrefoil head, the lateral have trefoil heads; over the central light are four quatrefoils enclosed in a large circle; traces of a dark red vine spray remain on the soffit; the two-light windows in the north and south walls have network tracery; in the south wall is a trefoil-headed piscina with credence shelf; in the

west bay on the north side are two openings, quatrefoil and rectangular respectively (now blocked), which communicated with the anchorite cell; the roof is similar to that of the Lady Chapel. On the south wall is a tablet to William Bray, joint author with Oliver Manning of a History of Surrey; he died in 1832 aged 97. On the floor is a brass on its original slab to Robert Scarclyf in mass vestments (1412) with inscription:—

Hic iacet dns Rob'tus Scarclyf quonda Rector isti'
Ecclie qui obiit XXV die Octobris Anno dni Millo
CCCC°XII. cuius aie ppicietur deus Amen. Amen.

His will directed burial to the south west of his predecessor's tomb, John Walter, and bequeathed to the church vestments and a picture of the Trinity, the Virgin, and St Christopher. There is also an inscription to Anne, daughter of the Earl of Ormond (1435):—

Hic iacet Anna filia comitis d'Ormound que
obiit iiii° die Ianuar' ano dm M°CCCCXXXV

On the south side was the table-tomb of John Touchet, Lord Audley (1491); it was removed in 1747, and the brass laid in the floor; both figure in armour and marginal inscription are restored, and are later than the date of his death:—

Hic iacet strenuus vir dominus Iohannes Towchet quondam dns de Awdeley qui obiit vicesimo die mens' Septembris Anno dni Millesimo Quadringentesimo Nonagesimo Cuius anime propicietur Deus Amen. The tower is Norman (c. mid. XIIc.) and separates the choir from the nave; its walls are 4 ft. thick; in the north side of the second stage is a two-light roundhead window, and in the south side, a single-light window; in each wall of the belfry, above a string, are three long round-head windows; possibly there was a parapet corbelled out, and a low pyramidal roof replaced later by a spire; c. 1280-1330, the east and west arches were replaced by larger pointed arches, the north and south were also replaced, but smaller; traces of the original still remain on the south side; the stairs with two loops are in the south west pier, and the door has wood from XVIIc. pews; the bellcage is XIVc. and was altered in 1895 to admit two additional bells; the six bells included in the Ed. VI Inventory were recast in 1590, and again in 1712 by R. Phelps. The spire was originally covered with lead, which was replaced by oak shingles c. 1500.

The transepts have disappeared; the north is replaced by a shallow recess between massive buttresses of the same date as the N. wall of the nave; the north wall (c. 1290-1330) has a four-light window with flowing tracery without external hood mould; the Sandes effigy has been transferred here.

The screen has disappeared; it was in existence in 1848 when R. and J. A. Brandon noted it as "a plain Perpendicular rood-screen with its doors." A lamp before the Rood was maintained by money received by hiring out two bows which belonged to the parish for archery; in 1515 was made a bequest to maintain a light before the Rood. In 18 Henry VII. 4/- was paid for 4 loads of timber for reu-making the Rood-loft,

and 4/1 for its carriage from Vachery to the churchyard; in 3 Henry VIII. 51/1 and 20/4 Rood-money, was collected; in 20 Henry VIII., and later, there were Roodwardens as well as Churchwardens.

The Nave appears to have been rebuilt between 1190-1280; the west doorway has a moulded arch, pointed, of two orders; the outer order has marble shafts and caps; the inner order of the jambs is square, with square caps; both orders have square abaci and crocket foliage; in west wall is a lancet; also, one of two-lights with square head in the west gable (XVc. type); at the east end of the north wall is an arched recess with a lancet (renewed), perhaps for a tomb or nave altar. At the west end is an oak gallery (XVIIIc.) approached externally by flight of stone steps and doorway at west end of the south wall of the aisle. The font is marble, supported on a central and angle shafts (end XIIc.). The west porch was renewed, as stated in the Churchwardens' Accounts, in 1547; the inner panelled doorway, iron studded, has a coat-of-arms (two bends and a canton impaling a bend), and the date 1626.

The South or Lady Chapel, built between 1190-1280, opens to the chancel by one bay, to the tower by another bay, and is connected with the south aisle by an arch; it replaced the south apsidal transept, and was extended east (without blocking the south window of the choir), between 1290-1330; a large buttress was added to the south-east pier of the tower in the earlier period; the east window has three-lights with trefoil heads, the lateral being narrower than the central; over them are two trefoils and a circle with four quatre-foils; in the south wall are two lancets, and towards the east a two-light window. In the floor at the east end is a brass with effigies of John Redfford in civil dress (1516), and wife and six children, with inscription; the figure of another child is lost:—"Off yor charite py for the soule of Iohn Redfford which decessid the XXVI day of May An°M°CCCCXVI on whois soule Ihu have m'ci." In a niche at the east end is another brass with effigy of a lady with flowing hair, and in a long gown (c. 1520); the inscription is lost. The roof is of oak, of trussed collar beam construction.

The South Aisle was added c. 1190-1280; the arch into the Lady Chapel has two moulded orders with moulded caps; the caps, jambs and shafts (four on each side) and bases, are of marble; the arcade of three pointed arches and piers, plastered over perhaps in XVIIc. may have been similar to this arch. In each south and west wall is a contemporary lancet of Bargate stone; the three-light west window (c. end of XIVc.), has tracery; the date of another three-light window with segmental head in the south wall is given on the Sandes brass; the window east of it is a lancet altered in XVIIIc. The south doorway (c. 1170), said to be one of the finest in the county, was originally in the south wall of the nave; it is roundheaded, of two orders, the outer having shafts, abaci, foliated caps, and bases, all of marble; the abacus is carried round the inner order; chevrons with foliage are on both orders, and plain chevrons on the soffits; the hoodmould has half-moon sinkings, and a head at the summit; there are several mass-dials and crosses on the jambs; the roundheaded inner arch is higher and plainer than the outer. The south porch is of brick (early XVIIc.), roofed with older

timber; its inner door is perhaps XIIc.; in the porch is a XIIIc. chest with two hatches, and the lid has a pin hinge; it is described by Mr Johnston in *Archaeol. Journal*, lxiv, pp. 272/3. A brass on the floor showed the effigy of Oliver Sandes in civil dress (1512) with inscription; the effigy has been removed to the north recess; effigies of his wife and children lost; the inscription reads:—

Pray for ye soullis of Olevier Sandes and Ione his wife ye which made this wyndow and this auter which olev' died ye VII day of noveber ye yer' of our lord MVXII on whos soll' ihu have M'cy.

The plate detailed in the Inventory of 6th October, 6 Edward VI. included two chalices, two silver pyxes, a latten cross, a latten cross-staff; four latten candlesticks included in a previous Inventory had been sold. Other plate appears to have been looted in 1547, when the Churchwardens charged 7/- for its delivery. A silver cup with cover (ciborium) of 1569 has been handed over to the new church at Peaslake. The extant Registers date from 1591; that ranging from 1545 to 1590 is lost.

There are remains of glass of various dates showing the Arms of England, Butler, Warene and Clare (in the east window of the chancel); the symbols of the Evangelists; the red rose of Lancaster; the flax-crusher, or bray, the crest of the Bray family; quarries with rose or cinquefoil pattern, and grisaille foliage.

The Churchwardens' Accounts beginning temp. Henry VII. also show possession of vestments embroidered with greyhounds and harts' heads; crosses; silver vessels; books; lights, including a sepulchre light in 1515: a chantry; altar of St Nicholas; images of St Nicholas, St Anthony, St Roch, St Mary of Pity; a new Bible and Book of Common-Prayer. (Manning & Bray, Vol. I.).

CHIPPING ONGAR CHURCH (ST MARTIN) (Visited 11th July 1931).

The place-name Angra (D. Bk.) means a wooded slope (such as the Hanger at Selborne); also known as Ongar-ad-Castrum, Angria, etc.; a market was held here, hence "Chipping" from A.S. "Chepe" (as in "Cheapside," "Eastcheap").

The original plan showed a chancel and nave; a vestry was added in 1861, and a south arcade and aisle in 1884; the west porch is also modern; materials used were Roman brick (origin uncertain), flints, and limestone dressings. The church was probably built by Richard de Lucy (d. 1179) upon whom the lordship of Ongar was bestowed c. 1162, and who strengthened the castle; it may perhaps date back to Eustace of Boulogne to whom William I granted Ongar, and to whom the erection of the early castle is attributed. Dr Cox inclined, however, to the opinion that the oldest work in the church, indicated by the numerous Roman tiles, and the long and short work (?) of the original east window, is late-Saxon rather than Norman.

Exterior. In the south wall of the chancel is a priests' doorway, found in 1887 with its original door and ironwork; it is now blocked internally; of one order, roundheaded, with moulded imposts; with re-

lieving arch of tiles on the exterior; and a round rerearch; the east jamb has a mass-dial. The woodwork in the east wall is late. In the north wall of the nave are two original narrow lights (one blocked) over which is a "turn" of Roman tiles; the jambs of the original north doorway are also of tiles; great use of such tiles occurs in the quoins of both choir and nave; the roughcast was removed in 1887 and revealed these tiles, also the flints ranged in courses. Both east and west gables have been lowered, probably when the roofs were renewed in XIV/XVc. There are no buttresses. An ankerhold was found in 1887 on the exterior of the north wall of the chancel; between the two windows is a restored roundhead recess in which is a small pointed opening, not sloped, with hinges and socket; a hole in the wall for the ridge purlin of the roof was found and filled in.

The Chancel. The arch was rebuilt in mid. XIVc.; it has two chamfered orders with semi-octagonal shafts, moulded caps and bases; the east window is a modern (1884) restoration, but the internal splays, moulded rerearch and engaged shafts with moulded caps and bases indicate an earlier window of c. 1300; this window replaced an unusual arrangement of two tiers of three lancets each, the jambs of four lancets still show on the exterior of the wall; in the north wall, the east window is an original roundheaded light with a sloping sill; west of it is a three-light window of brick (XVIc.), in a recess carried down to floor level; west of this is doorway to modern vestry; in the south wall are two windows; that to the east corresponds with its opposite in the north wall; the other is a group of three graduated stone lancets under a segmental rerearch (XIIIc.); a piscina with chamfered jambs and grooved basin (XIIIc.).

A black marble slab, within the Communion rails, commemorates Jane, a daughter of Sir Oliver Cromwell, a cousin of the Protector, and wife of Tobias Pallavicini ("Hic jacet Iana D. Oliveri Cromwellii, Hinchbrochiensis, a sedibus Huntingdoniensis, eques Balneensis, filia, uxor Tobiae Pallavicini armigeri . . . XXIII Martii annoq. Christi 1637"). There are other slabs to Horatio Pallavicini (1648); to Robert Hill (1648), Ann (King), his second wife (1668), and Anne Greatherd, his daughter (1683). On the south wall is a tablet by Nollekens to Mrs Sarah Mitford (1776); the arms (ludicrously said locally to show a flea, a fly, a louse and a comb) are a fesse between three moles (Mitford) impaling a chevron between three combs (Botell). The roof (cieled) is probably of the same date as that of the nave (the rafter ends are exposed on exterior of both nave and chancel), but strengthened in XVIIc.; there are three trusses; principals and subprincipals meet at a central post; each of the two eastmost posts end in a pierced pendant.

The Nave. The north wall has three windows of 1884, said to reproduce older features, and one original roundhead light; also the rerearch of the original doorway; the west wall has a modern doorway, over which is a three-light window perhaps inserted when the gallery was put up; in upper part of the same wall is a roundheaded window (restored externally), and each side of it are indications of another, cut away when the gable was lowered, perhaps in XVc.; at the west end

is a gallery (mentioned in 1770 as being enlarged), with the organ and Commandments; the font is modern. The roof XVc., now plastered, consists of three sets of principals with tiebeams, braces, wallpieces supported on stone corbels, and kingposts each with four braces; probably rafters, etc., are hidden behind the plaster; the corbels are older than the roof, and are carved; they show a mouth, wide open, a man's head, and a woman's head with a wimple; one has Norman volutes; the east tiebeam is divided at the centre, and the terminals show a crowned head, and a wimpled head; the wallplates appear low, due to plaster filling the space between them and the rafters. There are two dormers, north and south (XVIIIc.). At the west end is a timber bell-turret consisting of a square belfry, on which is a broached spire covered with lead, network fashion; it is supported by framework; at the west are two uprights, principals, etc.; on the south is an arch; at the east the main supports are cut short at the level of the gallery. There are two bells, one by Anthony Bartlet, 1672; the vane with pennon is wrought-iron (XVII/XVIIIc.). In 1285, John, clerk of Ongar, was killed by the clapper of a bell falling on him; in the verdict the value of the bell and clapper was assessed at 8/2, and the clapper declared deodand, to be redeemed accordingly. In 1537 Thomas Grene bequeathed £10 towards building the steeple.

No brasses remain; in the floor is a slab with indents of man and wife, inscription, four shields (c. 1500); there are monuments to John King (1657), his wife Elizabeth (1661), and their son Joseph (1679).

The hexagonal oak pulpit, XVIc., has two panels showing jewel ornament and arabesques. On east side of the north doorway is a holy water stoup, with round head and chamfered jambs.

The south arcade of four bays and the south aisle were added in 1884, many Roman tiles being found when the south wall of the nave was destroyed; the roof beams are supported by angels carved by H. Hems of Exeter; each angel bears a shield showing a Passion emblem; over the doorway are the Royal Arms.

The plate includes a silver-gilt paten of 1705 with maker's mark of Timothy Ley, and inscription; a silver-gilt cup and paten of 1728, with maker's mark of Thomas Tearle, and inscription; a silver-gilt flagon of 1729 with maker's mark as on the cup. The Registers (1558 to 1750) were printed in 1886 for F. A. Crisp.

Ornithological Records of the London Area, 1931.

BIRDS OBSERVED WITHIN TWENTY MILES OF ST PAUL'S CATHEDRAL.

THE counting of Great Crested Grebes during 1931 has helped to increase the reports from the reservoirs. Though the Grebe enquiry is being continued by the Society in its area during 1932 it is hoped that reports from the districts without reservoirs and lakes will increase. The Kentish portion of our area is still very neglected despite the importance of watching migration along the Thames. Several members are reporting annually from their chosen areas. The continuity of these reports is very valuable and an increase of these annual summaries will always be welcome. Considering that the whole of Middlesex lies within the Society's area, reports from this county are meagre, being almost confined to the reservoirs.

The following lists include only the more interesting records but all received have been filed. The table gives the results to 31st December 1931 for each division:—

No. of Division	1	2	3	4	5	6	7	8	9	10	11	12
No. of Species Recorded ...	94	92	160	131	92	150	108	144	129	85	96	95
No. of Species rec. Nesting	72	58	81	83	36	69	46	58	79	50	51	30
No. of Division	13	14	15	16	17	18	19	20	21	22	23	24
No. of Species Recorded ...	125	149	96	123	108	88	93	81	66	55	62	67
No. of Species rec. Nesting	68	60	39	41	46	42	39	22	13	15	6	7

Species new to our list are Bewick's Swan, Turnstone and Great Skua; and the British Willow-Titmouse is new to our list of breeding species. The total for our area is now 211 species (99 of them nesting). The total for the area north of the Thames is 201 species (94 nesting), and for the south 179 species (92 nesting).

All records are for 1931 except where otherwise stated.

Contributors to the published notes are indicated by initials:—

H. G. Attlee, per L. Parmenter	H.G.A.	R. W. Hayman	R.W.H.
S. Austin	S.A.	P. A. D. Hollom	P.A.D.H.
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L. Parmenter	L.P.	C. Weeks	C.W.
R. W. Pethen	R.W.P.	H. F. Witherby	H.F.W.
Miss M. Rew	M.R.	W. A. Wright	W.A.W.
E. C. Rowberry	E.C.R.	<i>British Birds</i> magazine	B.B.
Miss D. Venour	D.V.		

RECORDS.

BUCKINGHAMSHIRE.

BRAMBLING. *Fringilla montifringilla* L. Five at Langley on 5th January 1928 and three at Iver in December 1929 (E.C.R.).

SPARROW-HAWK. *Accipiter n. nisus* (L.). Nested at Black Park (E.C.R.).

TEAL. *Anas c. crecca* L. Poyle Pits, Colnbrook, regular winter visitor (E.C.R.).

WIGEON. *Anas penelope* L. Poyle Pits, Colnbrook, regular winter visitor (E.C.R.).

TUFTED DUCK. *Nyroca fuligula* (L.). Has nested regularly since 1928 at Poyle Pits, Colnbrook. Nest found on 2nd June (E.C.R.).

GREAT CRESTED GREBE. *Podiceps c. cristatus* (L.). Poyle Pits, Colnbrook, a pair bred in 1929 and two pairs in 1930 and 1931 (E.C.R.).

GREEN SANDPIPER. *Tringa ochropus* L. Langley, four on 8th August (G.C.L.).

WOODCOCK. *Scolopax r. rusticola* L. Seen near Black Park in April (E.C.R.).

ESSEX.

STARLING. *Sturnus v. vulgaris* L. An adult ringed at Polegate, Sussex, was recovered at Nazeing on 16th January (*B.B.*, xxv, p. 46).

SISKIN. *Carduelis spinus* (L.). Highams Park, two on 6th January and one on 31st January (E.L.K.) Wanstead Park, eight on 6th March (J.P.H.), two on 7th March (F.R.F. and A.H.M.); a flock of about twenty on 9th March (E.L.K.), three on 19th March, and eight on 14th December (D.L.L.).

GRASSHOPPER WARBLER. *Locustella n. naevia* (Bodd.). Epping Forest, one near the Warren on 2nd May (H.A.L.).

BRITISH SONG-THRUSH. *Turdus philomelus clarkei* Hart. An adult ringed at Woodford Green on 30th March 1930 was recovered where ringed on 25th January (*B.B.*, xxv, p. 48).

BLACKBIRD. *Turdus m. merula* L. An adult ringed at Woodford Green on 14th April 1929 was recovered where ringed on 9th June 1930 (*B.B.*, xxv, p. 50).

BRITISH ROBIN. *Erithacus rubecula melophilus* Hart. An adult ringed at Woodford Green on 16th March 1930 was recovered where ringed on 6th April and 26th December 1930 (*B.B.*, xxv, p. 51).

NIGHTJAR. *Caprimulgus e. europaeus* L. Epping Forest, at Larks Wood on 29th April (E.M.). Brentwood, one at Scrubs Hill on 28th June (H.A.L.).

COMMON HERON. *Ardea c. cinerea* L. Walthamstow Reservoirs, at least 24 on 7th March (H.A.L.). Wanstead Park, 30 nests were counted during April (W. H. Feakes, per H.A.L.).

BEWICK'S SWAN. *Cygnus b. bewickii* Yarr. One visited the Gravel Pit Pond, Wanstead Flats, on 5th February, and except for two brief periods remained until 4th April (J.P.H., in *B.B.*, xxiv, p. 339, and H.A.L.).

SCAUP-DUCK. *Nyroca m. marila* (L.). King George V. Reservoir, Chingford, a female on 23rd November (J.P.H. and A.H.M.). Walthamstow Reservoirs, two on 15th February (G.C.L. and A.H.M. in *B.B.*, xxiv, p. 356). Two on 18th December (Mr Jeffree, per J.P.H.).

GOLDENEYE. *Bucephala c. clangula* (L.). King George V. Reservoir, Chingford, one on 28th February (W.A.W.).

GOOSANDER. *Mergus m. merganser* L. King George V. Reservoir, Chingford, one on 28th February (W.A.W.).

SMEW. *Mergus albellus* L. Walthamstow Reservoirs, 17, including 6 adult males on 15th February (G.C.L. and A.H.M. in *B.B.*, xxiv, p. 356).

CORMORANT. *Phalacrocorax c. carbo* (L.). Walthamstow Reservoirs, one on 24th January, one on 11th February, one on 7th March, two on 20th June, and one on 28th June (J.P.H., H.A.L., and R.W.P.).

GREAT CRESTED GREBE. *Podiceps c. cristatus* (L.). King George V. Reservoir, 62 on 28th February, 80 on 14th March decreasing to 44 by 11th April, 65 on 2nd May, 53 on 30th May, 77 on 27th June, 133 on 18th July, 72 on 8th August, 144 on 22nd August, 93 on 29th August, 63 on 19th September, then a steady decrease to 17 on 28th December (W.A.W. and others). Walthamstow Reservoirs, 11 pairs breeding in July. There was a gradual increase from March, 78 on 20th June, 116 on 22nd and 23rd August, slight decrease to 97 on 10th and 11th October, then numbers decreased steadily (R.W.P. and others).

SLAVONIAN GREBE. *Podiceps auritus* (L.). Walthamstow Reservoirs, one in winter plumage on 30th October (J.P.H.).

BLACK-THROATED DIVER. *Colymbus a. arcticus* L. Walthamstow Reservoirs, one on 1st January (W. E. Glegg, per F.R.F. in *B.B.*, xxiv, p. 296).

RINGED PLOVER. *Charadrius h. hiaticula* L. Walthamstow Reservoirs, one on 19th September (R.W.P. and W.A.W.).

GOLDEN PLOVER. *Charadrius apricarius* L. King George V. Reservoir, 13 on 23rd November (J.P.H. and A.H.M.). Nazeingwood Common, about 100 on 1st February; Epping and Epping Upland, 40 to 60 respectively on 1st March (E.L.K.).

COMMON REDSHANK. *Tringa t. totanus* (L.). Lea Valley, one on 19th April (E.M.). Near Chigwell on 31st May (H.A.L.). King George V. Reservoir, one on 27th June (W.A.W.). Walthamstow Reservoirs, two flying over the "Racecourse" Reservoir on 25th July (E.M., R.W.P., and W.A.W.).

COMMON CURLEW. *Numenius a. arquata* (L.). Walthamstow Reservoirs, heard calling on 21st April (J.P.H.).

BLACK TERN. *Chlidonias n. niger* (L.). Walthamstow Reservoirs, one on 20th September (R.W.P.).

COMMON TERN. *Sterna h. hirundo* L. Walthamstow Reservoirs, one on 19th August (R.W.P.).

ARCTIC TERN. *Sterna macrura* Naumann. Walthamstow Reservoirs, a party of about 15 adult and immature birds on 22nd August (R.W.P. and W.A.W.).

BLACK-HEADED GULL. *Larus r. ridibundus* L. Two were recovered at Tilbury, one on 16th November 1929, which had been ringed at Tipperne, W. Jylland in 1920, and the other on 6th March 1930, which had been ringed at Selsoe Lake, Sjaelland in 1927. Walthamstow Reservoirs, one was recovered on 15th February which had been ringed near Kiel, Schleswig-Holstein on 6th July 1929 (*B.B.*, xxiv, p. 360).

COMMON GULL. *Larus c. canus* L. One was recovered at Walthamstow Reservoirs on 26th January 1930, which had been ringed at Vröj I. Sjaelland in 1929 (*B.B.*, xxiv, p. 361).

WATER RAIL. *Rallus a. aquaticus* L. Walthamstow Reservoirs, a dead bird was picked up by Mr Jeffree on 21st October (J.P.H.).

HERTFORDSHIRE.

NIGHTJAR. *Caprimulgus e. europaeus* L. Beaumont Manor, Cheshunt, one heard on 26th May and one seen and another heard on 9th June (H.A.L.).

GREAT CRESTED GREBE. *Podiceps c. cristatus* (L.). Cheshunt Reservoir, two pairs bred (H.A.L.). Elstree Reservoir, 4 on 14th February, 2 on 15th February, 2 on 4th April and 4 on 9th December (E.L.K., L.P., H.W.).

BLACK-NECKED GREBE. *Podiceps n. nigricollis* Brehm. Elstree Reservoir, one on 14th February (E.L.K.).

WOODCOCK. *Scolopax r. rusticola* L. Beaumont Manor, Cheshunt, two on 31st January (S.A.).

KENT.

STARLING. *Sturnus v. vulgaris* L. An adult ringed at Beckenham, on 7th February 1930, was recovered at Isleworth, Middlesex, on 3rd March 1931 (*B.B.*, vol. xxv, p. 46).

HAWFINCH. *Coccothraustes c. coccothraustes* (L.). Mottingham, 3 seen on 8th July (J.G.M.).

MIDDLESEX.

Records of birds seen at the reservoirs in the Lea Valley are dealt with under ESSEX.

HOODED CROW. *Corvus c. cornix* L. Staines Reservoir, one on 21st November (F.R.F.).

STARLING. *Sturnus v. vulgaris* L. One ringed at Beckenham, Kent, on 7th February 1930, was recovered at Isleworth on 3rd March 1931 (*B.B.*, vol. xxv, p. 46).

SISKIN. *Carduelis spinus* (L.). Littleton Reservoir, one on 23rd April (J.P.H.). Stanmore Common, three, possibly more, on 12th December (G.H.).

WHITE WAGTAIL. *Motacilla a. alba* L. Littleton Reservoir, three on 23rd April and one on 28th April (J.P.H.). Staines Reservoirs, one on 26th April (F.R.F. and other observers).

BRITISH WILLOW-TITMOUSE. *Parus atricapillus kleinschmidti* Hellm. A bird was found nest-excavating on 11th April at the same locality in North Middlesex as reported in *London Naturalist*, 1930, p. 125 (W. E. Glegg and L.P.). On 16th May the nest was seen to be in occupation by H.A.L., but when this observer visited the spot a fortnight later, the tree had been torn open, exposing the nest, which contained one whole egg and some pieces of shell. A nest containing half-fledged young was found on 23rd May, in the lower Colne Valley (E.C.R. in *B.B.*, xxv, p. 163).

NIGHTINGALE. *Luscia m. megarhyncha* Brehm. Littleton Reservoir, two on 28th April. Staines Reservoirs, two on 1st May (J.P.H.).

PEREGRINE FALCON. *Falco p. peregrinus* Tunst. A pair seen gliding over Osterley Park on 6th October 1930. They stayed two days (E.C.R.).

SPARROW-HAWK. *Accipiter n. nisus* (L.). Osterley Park, a nest was found on 18th May 1928 (E.C.R.).

SHELDUCK. *Tadorna tadorna* (L.). Staines Reservoirs, one on 26th April (F.R.F., A.H.M., and others).

GADWALL. *Anas strepera* L. Staines Reservoir, one drake on 29th October (D. Gunn, per L.P. and A.H.M.).

TEAL. *Anas c. crecca* L. A pair seen near the western border of Middlesex on 21st March and again on 16th April. "I stumbled over a female and three small young on 28th May" (E.C.R. in *B.B.*, xxv, p. 134).

PINTAIL. *Anas a. acuta* (L.). Staines Reservoir, one on 31st October, one on 14th November, a pair on 25th November, one male on 6th December, and one on 8th December (J.P.H., P.A.D.H., G.C.L., and A.H.M.).

SHOVELER. *Spatula clypeata* (L.). Staines Reservoir, one male on 11th January, one on 1st February, 3 to 10 during October, 1 to 3 in November, 3 on 8th December, and one on 25th December (L.M.E. and others). Littleton Reservoir, 2 to 5 in September, 3 on 5th October, and up to 10 during December (J.P.H.). Highgate Pond, a female on 8th March; Hampstead Heath, one on 6th December (W.B.W.).

COMMON POCHARD. *Nyroca f. ferina* (L.). "There was strong presumptive evidence that a pair nested in a thick reed bed at the S. end of the lake in Osterley Park. The female came out of the reeds in late evenings during the latter part of May" (E.C.R.).

SCAUP-DUCK. *Nyroca m. marila* (L.). Staines Reservoirs, one male on 14th, 15th, and 22nd March, and one female on 6th December (L.M.E., G.C.L., and A.H.M.). Round Pond, Kensington Gardens, an immature male on 21st November, which, but for a slight break from 25th-27th November, stayed till 18th December (G.C.L. in *B.B.*, xxv, p. 304).

COMMON SCOTER. *Oidemia n. nigra* (L.). Staines Reservoirs, one male on 23rd August and a female on 13th November (D. Gunn, per A.H.M.).

RED-BREASTED MERGANSER. *Mergus serrator* L. Staines Reservoir, a female or immature male on 19th February (H.F.W. in *B.B.*, xxiv, p. 341).

SMEW. *Mergus albellus* L. Largest number recorded was at Hampton Reservoirs, 29, 11 being adult males, on 22nd February (P.A.D.H.).

CORMORANT. *Phalacrocorax c. carbo* (L.). Littleton Reservoir, 27 on 18th September and one on 23rd and 24th September (J.P.H. in *B.B.*, xxv, p. 165); one on 5th and 20th October and 12th and 22nd December (J.P.H. and A.H.M.). Staines Reservoirs, one on 19th February (H.F.W., per A.H.M., in *B.B.*, xxiv, p. 355), and two on 4th October (L.M.E. and others).

SHAG. *Phalacrocorax a. aristotelis* (L.). Staines Reservoir, one on 18th February (D. Gunn in *B.B.*, xxiv, p. 342, and E.L.K.).

GREAT CRESTED GREBE. *Podiceps c. cristatus* (L.). At a flooded gravel pit between Ashford and Feltham, a pair bred (E.C.R.); 4 on 8th December (J.P.H.). Brent Reservoir, 12 on 9th May (L.P.); 6 on 22nd August, 11 on 8th September, 20 to 25 on 12th October, and 4 on 15th November (J.P.H.). Gunnersbury Park, a pair bred (C.W.). Hampton Reservoirs, up to 8 during January to April, 2 to 6 October to December (L.M.E., J.P.H., P.A.D.H.). Hanworth Reservoir, 1 on 15th February (H.W.). Hyde Park, one on 12th February (G.C.L.). Kensington Gardens, 2 on the Round Pond, 23rd March (G.C.L.). Littleton Reservoir, from none on 26th February to 6 on 28th April, 30 on 20th August, 50 to 60 on 24th September, 12 on 5th October, 3 to 4 during December (J.P.H.). Osterley Park, 2 pairs bred (E.C.R.). Ruislip Reservoir, 4 on 21st February, 15 to 17 on 22nd March, 6 pairs in April and May, 4 pairs June to September (3 pairs bred), 6 birds on 7th November (H.L.L., J.D.V.). Staines Reservoir, about 100 on 11th January (L.M.E.), from 26 on 17th January numbers decreased to one on 4th April. There were 21 on 30th May, 46 on 28th June, 18 on 1st August, 38 on 15th August, then an increase to 146 on 19th September, 120 to 130 on 27th September, 112 on 3rd October, 156 on 18th October (G.C.L.), then a gradual decrease during November, 11 on 26th December (D.H.C., L.M.E., J.P.H., P.A.D.H., E.L.K., and E.C.R.). Stoke Newington Reservoirs, 16 on 16th January, 6 on 26th January and 2nd March, 5 on 20th March. 3 pairs bred (C.W.).

SLAVONIAN GREBE. *Podiceps auritus* (L.). Staines Reservoirs, three on 28th and 30th November, two on 6th December, and three on 8th December (J.P.H., G.H., and others).

BLACK-NECKED GREBE. *Podiceps g. griseigena* (Bodd.). Round Pond, Kensington Gardens, one on 28th September (G.C.L. in *B.B.*, xxv, p. 166). Littleton Reservoir, one in winter plumage on 28th August (J.P.H. and A.H.M.). Staines Reservoirs, one in almost full summer plumage on 29th March (F.R.F. and others), one on 9th, 16th and 28th August, 1st September, 11th and 18th October, and two on 31st October (G.C.L., A.H.M., and E.C.R.). Staines Common Pond, one from 28th November until 26th December (J.P.H., G.C.L., and A.H.M.).

GREAT NORTHERN DIVER. *Colymbus immer* Brunn. Staines Reservoirs, two on 1st and 4th January, one from 10th January until 1st

February, and one on 5th and 6th December. A bird which was probably the last mentioned at Staines Reservoirs stayed on Feltham Gravel Pit from 8th till 27th December (F.R.F., A.H.M. and others).

BLACK-THROATED DIVER. *Colymbus a. arcticus* L. Staines Reservoirs, one from 1st until 18th January (F.R.F. and others).

OYSTER CATCHER. *Haematopus o. ostralegus* L. Littleton Reservoir, one on 23rd April (J.P.H. in *B.B.*, xxv, pp. 24 and 308). One flew across the river in a north-westerly direction from Hammersmith on 21st August (G.C.L., *B.B.*, xxv, p. 135).

RINGED PLOVER. *Charadrius h. hiaticula* L. Staines Reservoirs, two on 15th August, two on 21st August, and one on 6th September (J.P.H., E.L.K., and D.L.L.). Littleton Reservoir, one on 18th September (J.P.H.).

GOLDEN PLOVER. *Charadrius apricarius* L. Staines Reservoir, one on 3rd October (A.H.M.). Staines Moor, about 15 on 19th December (G.H.).

GREY PLOVER. *Squatarola s. squatarola* (L.). Staines Reservoirs, one on 15th November (W. E. Glegg, per J.P.H. and A.H.M., in *B.B.*, xxv, p. 272). Littleton Reservoir, one on 12th December (J.P.H. and A.H.M., in *B.B.*, xxv, p. 272.).

LAPWING. *Vanellus vanellus* (L.). Five parties, involving several hundred birds, seen flying steadily westward over Staines Reservoir on 21st August (D.L.L.).

TURNSTONE. *Arenaria i. interpres* (L.). Littleton Reservoir, one immature bird; probably two or three more, on 20th August (J.P.H. and A.H.M., in *B.B.*, xxv, pp. 134 and 135).

RUFF. *Philomachus pugnax* (L.). Littleton Reservoir, one immature male on 28th August (J.P.H. and A.H.M., in *B.B.*, xxv, pp. 134 and 135).

SANDERLING. *Crocethia alba* (Pall). Littleton Reservoir, three immature birds on 28th August (J.P.H. and A.H.M. in *B.B.*, xxv, pp. 134 and 135), and one immature bird on 18th September (J.P.H.).

DUNLIN. *Calidris alpina* (L.). Littleton Reservoir, nine in summer plumage on 28th April, one on 26th August, and two on 28th August (J.P.H.). Hampton Reservoirs, one on 16th August (L.M.E.). Staines Reservoirs, one on 21st August, and one on 6th September (D.L.L. and G.C.L.).

GREEN SANDPIPER. *Tringa ochropus* L. South Harrow Sewage Farm, five on 11th July, and one on 16th August (J.P.H.).

COMMON REDSHANK. *Tringa t. totanus* (L.) Staines Reservoirs, one on 15th March (P.A.D.H.). Littleton Reservoir, two on 28th April (J.P.H.). South Harrow Sewage Farm, one on 4th May, and two on 11th July (J.P.H.). Two pairs nested in Colne Valley and one pair in 1930 (E.C.R.).

COMMON CURLEW. *Numenius a. arquata* (L.). Staines Reservoirs, two on 9th and 10th May (F.R.F. and A.H.M.).

BLACK TERN. *Chlidonias n. niger* (L.). Littleton Reservoir, 20 on 26th August and 3 on 28th August (J.P.H. and A.H.M.).

SANDWICH TERN. *Sterna s. sandvicensis* Lath. Littleton Reservoir, one on 20th August (J.P.H. and A.H.M.).

COMMON TERN. *Sterna h. hirundo* L. Staines Reservoirs, one on 16th August and two on 21st August (L.M.E. and D.L.L.). Littleton Reservoir, 20 on 20th August, 30 on 26th August, and two on 28th August (J.P.H. and A.H.M.). Kingsbury Reservoir, one on 8th September (J.P.H.).

LITTLE TERN. *Sterna a. albifrons* Pall. Littleton Reservoir, one on 26th August (J.P.H. and A.H.M.).

LITTLE GULL. *Larus minutus* Pall. Littleton Reservoir, one immature bird on 4th December (J.P.H. and A.H.M., in *B.B.*, xxv, p. 272).

BLACK-HEADED GULL. *Larus r. ridibundus* L. An immature bird was recovered at Littleton Reservoir on 18th September, which had been ringed at Neschwitz, Saxony, on 2nd June (H.F.W.).

LESSER BLACK-BACKED GULL. *Larus fuscus* L. ? sub-species. Littleton Reservoir, two on 23rd April, 4 on 20th, 2 on 26th and 10 on 28th August, 50 to 70 on 18th September, 10 on 23rd and 50 on 24th September, 30 on 5th November, one on 4th December, and one on 22nd December (J.P.H.). Staines Reservoirs, one on 19th July, and one on 2nd December (J.P.H.). About 50 at Wembley on 16th August (H.A.L.).

GREAT BLACK-BACKED GULL. *Larus marinus* L. Littleton Reservoir, one on 23rd April (J.P.H.).

GREAT SKUA. *Stercorarius s. skua* (Brünn). Staines Reservoirs, one on 14th February (A.H.M. and E.C.R. in *B.B.*, xxiv, pp. 299 and 300).

LAND RAIL. *Crex crex* (L.). One was picked up in Leicester Square on 29th November 1930, and another was found in an exhausted condition in the vicinity of Ciro's Club, Orange Street, W., on 21st October (T. Hinton, per C.S.B.).

WATER RAIL. *Rallus a. aquaticus* L. One seen in thick reed bed near Stanwell on 4th August 1930. Highgate Pond, one on 21st March (W.B.W.).

SURREY.

HOODED CROW. *Corvus c. cornix* L. Beddington Sewage Farm, 4th January to 15th March, one or two (L.P.).

CARRION-CROW. *Corvus c. corone* L. Thames, Barnes, 25 together, 22nd March (C.W.).

HAWFINCH. *Coccothraustes c. coccothraustes* (L.). Walton Heath, seven; Frith Park, one on 6th April (L.P.).

SISKIN. *Carduelis spinus* (L.). Richmond Park, a flock of thirty, 15th February to 1st March, four ♀♀ 8th March (L.M.E., F.R.F., E.L.K., and C.W.).

COMMON CROSSBILL. *Loxia c. curvirostra* L. Kingswood, six, 29th March, eight, 6th April (L.P.); one 25th May (H.B.). Near Ockham, twelve, 22nd March (C.W.). Near Sutton, one, 15th February, four, 22nd February, three, 13th March (P.H.T.H.).

BRAMBLING. *Fringilla montifringilla* L. Beddington Sewage Farm, 15th February to 12th April (about 360 on 22nd March), one on 20th December. Kingswood, about 12 on 29th March (L.P.).

CIRL BUNTING. *Emberiza cirrus* L. Sutton, at least one pair, 30th November 1930 (P.H.T.H.).

ROCK PIPIT. *Anthus spinoletta petrosus* (Mont.). Barn Elms Reservoirs, 2 on 14th October, 6 on 16th October (E.L.K.).

GREY WAGTAIL. *Motacilla c. cinerea* Tunst. Nested near Leatherhead and Godstone (H.B.).

WHITE WAGTAIL. *Motacilla a. alba* L. Sutton, one on 16th April (P.H.T.H.). Barn Elms Reservoirs, one on 6th April (G.C.L.); one on 30th April (J.P.H.).

BRITISH WILLOW-TITMOUSE. *Parus atricapillus kleinschmidti* Hellm. Selsdon, two on 4th May; Addington, two on 4th May (L.P.).

PIED FLYCATCHER. *Muscicapa h. hypoleuca* (Pall). Beddington Sewage Farm, one in brown plumage, 30th August (L.P.).

BRITISH STONECHAT. *Saxicola torquata hibernans* (Hart). Tadworth, nest and four young found on 22nd August (third brood) (H.B.).

BLACK REDSTART. *Phoenicurus ochrurus gibraltariensis* (Gm.). Beddington Sewage Farm, one on 24th October (H.B.).

NIGHTJAR. *Caprimulgus e. europaeus* L. Barn Elms Reservoirs, one on 13th May (E.L.K.).

WRYNECK. *Jynx t. torquilla* L. Tadworth, one on 3rd October—a late date (H.B.).

HOBBY. *Falco s. subbuteo* L. Addlestone, one on 20th August (P.A.D.H.).

SPARROW-HAWK. *Accipiter n. nisus* (L.). Richmond Park, one seen on 5th May (L.P.).

COMMON HERON. *Ardea c. cinerea* L. Hersham, 20 nests in 14 trees on 21st April (P.A.D.H.). Richmond Park, 30 nests (C.W.).

BITTERN. *Botaurus s. stellaris* (L.). Beddington Sewage Farm, one on 28th March 1928 (P.H.T.H.).

SHELD-DUCK. *Tadorna tadorna* (L.). Barn Elms Reservoirs, one young bird, 16th to 21st August (J.P.H., D.L.L., G.C.L., A.H.M.). (N.B.—The Sheld-Duck did not breed in St James' Park this year.)

WIGEON. *Anas penelope* L. Barn Elms Reservoirs, one on 24th January (L.M.E.); two on 13th December (J.P.H.). Beddington, nine on 1st March, one female on 1st November (L.P.). Molesey Reservoirs, one on 27th December (J.P.H.). Richmond Park, three on 24th March (C.W.).

SHOVELER. *Spatula clypeata* (L.). Beddington, three on 27th March, one on 3rd April, a pair on 29th April to 8th May (L.P.); a pair on 26th April (P.H.T.H.), and one on 24th October (H.B.). Barn Elms Reservoirs, one on 8th and 22nd, a pair on 27th March, two pairs on 10th April, one on 26th May, 15th and 23rd August, a pair on 14th, one on 16th and 21st September, one on 21st October, and eight on 24th November (J.P.H., E.L.K., G.C.L., D.L.L., and A.H.M.). Molesey Reservoirs, three on 11th January, one 22nd February, and three on 12th December (D.L.L.). Weybridge, a pair on 2nd and 7th May (P.A.D.H.).

COMMON POCHARD. *Nyroca f. ferina* (L.). Nested at Barn Elms Reservoirs, four young (J.P.H., G.C.L.). Richmond Park, nested, four young (L.M.E.).

TUFTED DUCK. *Nyroca fuligula* (L.). Nested at Beddington, Gatton Park (two pairs) (H.B.), Godstone (E.L.K.), and two pairs at Richmond Park (L.M.E.). Did not breed at Barn Elms Reservoirs (J.P.H.).

SCAUP-DUCK. *Nyroca m. marila* (L.). Barn Elms Reservoirs, a male from 9th January to 14th March (D.L.L. and others). Island Barn Reservoir, a female on 14th March (P.A.D.H.). Molesey Reservoirs, one on 25th January, three 22nd March, two 6th April, three 28th April, two 27th December, and one male from 31st October to 31st December (F.R.F., J.P.H., P.A.D.H., and A.H.M.).

GOLDENEYE. *Bucephala c. clangula* (L.). Barn Elms Reservoirs, one January and February, two November, three December. Molesey Reservoirs, maximum twelve on 1st March, including two adult males (J.P.H., P.A.D.H., G.C.L., and A.H.M.).

COMMON SCOTER. *Oidemia n. nigra* (L.). Barn Elms Reservoirs, a pair on 7th April (F.R.F.).

GOOSANDER. *Mergus m. merganser* L. Maximum numbers seen, Barn Elms Reservoirs, 4 on 24th January (L.M.E.), Island Barn Reservoir, 13 on 22nd February (P.A.D.H.), Molesey Reservoirs, 62 on 14th March (P.A.D.H.), Richmond Park, 19 on 25th December (P.I.W.).

SMEW. *Mergus albellus* L. Maximum numbers seen, Molesey Reservoirs, 29 (thirteen adult drakes) on 12th December (P.A.D.H.), Barn Elms Reservoirs, 16 on 2nd March (J.P.H.), and Lonsdale Road Reservoirs, 13 (eight adult drakes) on 31st December (A.H.M.).

CORMORANT. *Phalacrocorax c. carbo* (L.). Barn Elms Reservoirs, one on 28th September (J.P.H.). Molesey Reservoirs, one on 7th August (P.A.D.H.).

GREAT CRESTED GREBE. *Podiceps c. cristatus* (L.). Barn Elms Reservoirs, from 60 on 4th January, numbers decreased to 22 by the end of the month. During February and March there was an average of 20 birds with almost daily fluctuations. In April there was a further decrease and the average for May was 12. From 6 at the beginning of June there was an increase which reached the maximum of 91 on 17th October, followed by a steady decrease to 27 on 19th December. By the 24th December the number had recovered to 46 (10 observers). Lonsdale Road Reservoirs, Barnes, from 1 in February numbers rose gradually to 8 by the end of March; 13 on 17th April (J.P.H.), after which there was a decrease, none seen in July. From August to December the number present varied from one to six. Godstone, a pair bred (H.B. and E.L.K.). Island Barn Reservoir, Molesey, 54 on 2nd February, 1 on 1st March, 12 on 14th March, 4 on 8th April, none on 11th June, 6 on 18th July (P.A.D.H.). Molesey Reservoirs, from 77 on 5th January (E.L.K.) there was a decrease to 54 on 7th February, then a rise to 73 on 22nd February, a drop to 55 on 1st March, a rise to 91 on 11th March (breeding waters in the neighbourhood frozen over) then a quick fall to 13 by 28th March. During April, May and June numbers varied from 7 to 18. On 5th July, 32 were counted, then came a steady increase to 162 on 24th October followed by a decrease to 64 on 12th December. There were 99 on 19th December, but 83 on 24th December (P.A.D.H.). Richmond Park, first bird seen on 29th January. There

was a gradual increase to 8 on 1st March, then none whilst the ponds were frozen, 5 on 20th March, 2 to 4 birds seen throughout April, May and June. In August a young bird was seen but later it had disappeared. During September to December, up to two birds were present (E.L.K., H.W., and others). Wimbledon Park, two pairs on 5th May (L.P.).

SLAVONIAN GREBE. *Podiceps auritus* (L.). Molesey Reservoirs, one on 27th December (J.P.H.).

BLACK-NECKED GREBE. *Podiceps n. nigricollis* Brehm. Barn Elms Reservoirs, one seen from 1st September to 10th October (E.L.K., A.H.M., and others). Molesey Reservoirs, one on 18th October (P.A.D.H.), two on 19th and 20th December (D.L.L.).

STONE CURLEW. *Burhinus o. oedicnemus* (L.). Wimbledon Common, one on 24th March (R. W. Hayman, *B.B.*, vol. 24, p. 371).

OYSTER-CATCHER. *Haematopus o. ostralegus* L. Barn Elms Reservoirs, one on 21st August (G.C.L., *B.B.*, vol. 25, p. 135) one on 23rd August (D.L.L.).

RINGED PLOVER. *Charadrius h. hiaticula* L. Barn Elms Reservoirs, two on 19th August, one on 6th and 8th September (D.L.L., G.C.L., and A.H.M.).

GOLDEN PLOVER. *Charadrius apricarius* L. Beddington Sewage Farm, eight on 14th March (P.H.T.H.), one on 22nd November, and four on 25th December (L.P.).

DUNLIN. *Calidris alpina* (L.). Barn Elms Reservoirs, one on 5th May, 14th July, 11th, 20th, 21st August; Lonsdale Road Reservoirs, two on 21st August (J.P.H., E.L.K., and L.P.).

LITTLE STINT. *Calidris minuta* (Leisl.). Barn Elms Reservoirs, one 22nd September (G.C.L., *B.B.*, vol. 25, p. 167).

COMMON SANDPIPER. *Tringa hypoleucos* L. Barn Elms Reservoirs, one seen up to 2nd February (J.P.H., G.C.L., A.H.M., and L.P.). Molesey Reservoirs, one seen on 7th January and 12th December (J.P.H. and P.A.D.H.).

GREEN SANDPIPER. *Tringa ochropus* L. Beddington Sewage Farm, one on 22nd March (L.P.).

COMMON REDSHANK. *Tringa t. totanus* (L.). Barn Elms Reservoirs, one on 9th January, 28th March, 12th and 29th May, 11th August, and two on 5th November (J.P.H., E.L.K., D.L.L., and G.C.L.). Beddington Sewage Farm, nested (L.P.). Molesey Reservoirs, one on 22nd March (D.L.L.). Richmond Park, one heard on 1st August (H. G. Attlee, per L.P.).

GREENSHANK. *Tringa nebularia* (Gunn). Beddington Sewage Farm, one on 17th May (L.P.).

GREY PHALAROPE. *Phalaropus fulicarius* (L.). Barn Elms Reservoirs, one juvenile found dead on 9th November (A.H.M., *B.B.*, vol. 25, p. 203).

COMMON CURLEW. *Numenius a. arquata* (L.). Barn Elms Reservoirs, nine on 23rd August and one on 27th September (D.L.L.). Barnes, one on Thames mud, 14th March (H. G. Attlee, per L.P.).

SANDWICH TERN. *Sterna s. sandvicensis* Lath. Two seen at Barn Elms Reservoirs on 4th August (E.L.K., *B.B.*, vol. 25, p. 104).

COMMON TERN. *Sterna h. hirundo* L. One or two seen at Barn Elms Reservoirs on 8th June (E.L.K.) and in August (various observers).

LITTLE TERN. *Sterna a. albifrons* Pall. One seen at Barn Elms Reservoirs on 7th May (E.L.K., B.B., vol. 25, p. 24).

LESSER BLACK-BACKED GULL. *Larus fuscus* L. Barn Elms Reservoirs, greatest number seen, 120 on 11th August (J.P.H.), 86 of the British form seen on 12th August (A.H.M.).

GREAT BLACK-BACKED GULL. *Larus marinus* L. Barn Elms Reservoirs, eleven on 24th January (L.P.), one on 13th February, 2nd March and 31st December (J.P.H. and A.H.M.).

RED-LEGGED PARTRIDGE. *Alectoris r. rufa* (L.). Addington, two seen on 4th May (L.P.).

ARRIVAL OF MIGRANTS, 1931.

The order is that of the earliest recorded date for each species. The table gives only the earliest date for each county. Counties are indicated by their initial letter:—B.=Bucks, E.=Essex, H.=Herts, K.=Kent, M.=Middlesex, S.=Surrey.

COMMON REDSHANK.

Mar. 15—M. Staines Res. P.A.D.H.
 „ 15—S. Beddington. L.P.
 „ 19—E. Lea Valley. E.M.

CHIFFCHAFF.

Mar. 21—S. Addlestone. P.A.D.H.
 „ 28—E. King George V. Res.,
 Chingford. W.A.W.

COMMON SANDPIPER.

Mar. 22—S. Barn Elms Res. D.L.L.
 The wintering bird was reported up to February 2nd, the next date after March 22nd on which the species was seen was April 17th.

STONE CURLEW.

Mar. 24—S. Wimbledon Common.
 R.W.H.

WILLOW WARBLER.

Mar. 28—S. Richmond Park. J.P.H.
 April 11—E. King George V. Res.
 E.M., W.A.W.
 „ 12—M. Regents Park. M.R.

WHEATEAR.

April 3—S. Beddington. L.P.
 „ 4—E. Walthamstow Res.
 R.W.P.
 „ 5—M. Regents Park. M.R.

SWALLOW.

April 4—S. Sutton. P.H.T.H.
 „ 23—M. Littleton Res. J.P.H.
 „ 25—E. King George V. Res.
 W.A.W.

SEDGE WARBLER.

April 26—M. Staines Res. G.C.L.
 „ 26—S. Beddington. L.P.
 „ 26—S. Sutton. P.H.T.H.
 May 10—E. Lea Valley. E.M.

NIGHTINGALE.

April 28—M. Littleton Res. J.P.H.
 May 2—E. Epping Forest. G.H.
 „ 2—S. Weybridge. P.A.D.H.

NIGHTJAR.

April 29—E. Epping Forest. E.M.
 May 13—S. Barn Elms Res. E.L.K.

REED WARBLER.

April 29—S. Beddington. L.P.

GRASSHOPPER WARBLER.

May 2—E. Epping Forest. H.A.L.
 „ 16—S. Bookham. C.W.

TURTLE DOVE.

May 2—S. Tadworth. H.B.
 „ 9—M. Stanmore. L.P.

SPOTTED FLYCATCHER.

May 3—E. Wanstead Park. H.A.L.
 „ 9—M. Stanmore. L.P.
 „ 15—S. Addlestone. P.A.D.H.

WOOD WARBLER.

May 5—S. Wimbledon Common.
 L.P.
 „ 9—M. Stanmore. L.P.

LITTLE TERN.

May 7—S. Barn Elms Res. E.L.K.

TREE PIPIT.

April 6—S. Molesey. J.P.H.
 „ 6—S. Sutton. P.H.T.H.
 „ 11—E. South Chingford. E.M.

YELLOW WAGTAIL.

April 8—S. Beddington. L.P.
 „ 11—E. King George V. Res. W.A.W.
 „ 19—M. Staines Res. G.C.L.

REDSTART.

April 10—S. Richmond. H.G.A.
 „ 12—E. Epping Forest. W.A.W.

SAND MARTIN.

April 11—S. Barn Elms Res. C.W.
 „ 19—E. Lea Valley. E.M.

CUCKOO.

April 12—S. Limpsfield. C.W.
 „ 26—E. Epping Forest. E.M.

GARDEN WARBLER.

April 12—S. Epsom. L.M.E.
 „ 26—E. Epping Forest. E.M.

WHITETHROAT.

April 12—S. Epsom. L.M.E.
 „ 25—E. Hainault Forest. G.H.
 „ 25—M. Staines Res. G.C.L.

WRYNECK.

April 12—S. Riddlesdown. G.H.

MARTIN.

April 19—S. Sutton. P.H.T.H.
 „ 29—E. Chingford Mount. E.M.

BLACKCAP.

April 23—S. Kew. H.G.A.
 „ 29—E. Epping Forest. E.M.

WHINCHAT.

April 23—M. Littleton Res. J.P.H.
 „ 30—S. Barn Elms Res. E.L.K.
 May 2—E. King George V. Res. W.A.W.

WHITE WAGTAIL.

April 23—M. Littleton Res. J.P.H.

SWIFT.

April 25—E. King George V. Res. W.A.W.
 „ 25—E. Walthamstow Res. H.A.L., R.W.P.
 „ 25—S. Barn Elms Res. E.L.K., G.C.L.

RED-BACKED SHRIKE.

May 9—S. Tadworth. H.B.

WIGEON.

Sept. 1—M. Staines Res. A.H.M.
 Nov. 1—S. Beddington. L.P.

COMMON GULL.

Sept. 4—S. Barn Elms Res. J.P.H.

REDWING.

Sept. 27—S. Tadworth. H.B.
 Oct. 2—E. Manor Park. H.A.L.

GOLDENEYE.

Oct. 18—E. Epping Forest. G.C.L., A.H.M.
 Nov. 12—S. Barn Elms Res. J.P.H.

GOOSANDER.

Oct. 29—M. Staines Res. A.H.M.
 Nov. 21—S. Molesey. P.A.D.H.

FIELDFARE.

Oct. 30—E. Walthamstow Res. J.P.H.
 Nov. 1—S. Beddington. L.P.

PINTAIL.

Oct. 31—M. Staines Res. G.C.L.

SCAUP-DUCK.

Oct. 31—S. Molesey. P.A.D.H.
 Nov. 21—M. Kensington Gardens. G.C.L.
 „ 23—E. King George V. Res. J.P.H., A.H.M.

HERRING GULL.

Nov. 5—S. Barn Elms Res. J.P.H.

SMEW.

Nov. 27—S. Barn Elms Res. A.H.M.
 Dec. 25—M. Hampton Res. L.M.E.
 „ 26—E. Walthamstow Res. R.W.P.

SISKIN.

Dec. 12—M. Stanmore. G.H.

BRAMBLING.

Dec. 20—S. Beddington. L.P.

RECOVERIES OF RINGED BIRDS.

- (1) A Starling ringed as a nestling near Worthing by Miss F. Collins, 24th May 1926, and recovered where ringed 18th May 1930 by the ringer.
- (2) A Starling ringed as an adult at Yell (Shetland Isles) 5th March 1924, and recovered where ringed 15th November 1930 by C. J. Inkster (per Mr W. E. Glegg).
- (3) A Starling ringed as an adult at Beckenham (Kent) by Mr G. Waller 7th February 1930, and recovered at Isleworth (Middlesex) 3rd March 1931 by L. Over.
- (4) A Wood Warbler ringed as a nestling at Glasbury (Radnor) 17th June 1930 by Mr P. A. D. Hollom, and recovered near Avellino (S. Italy) 2nd October 1930 by A. Pacifico.
- (5) A Robin ringed as an adult at Woodford Green (Essex) 16th March 1930 by Mr C. L. Collenette, and recovered where ringed 6th April 1930 and 26th December 1930 by the ringer.
- (6) A Song Thrush ringed as an adult at Woodford Green 30th March 1930 by Mr C. L. Collenette, and recovered where ringed 25th January 1931 by the ringer.
- (7) A Song Thrush ringed as an adult at Woodford Green 27th February 1929 by Mr C. L. Collenette, and recovered where ringed 6th March 1929 and 30th March 1930 by the ringer.
- (8) Five Blackbirds ringed at Woodford Green by Mr C. L. Collenette as follows:—
 - (a) Adult ringed 15th June 1929, and recovered where ringed 23rd March 1930 by the ringer.
 - (b) Adult ringed 13th July 1929, and recovered where ringed 30th March 1930 by M. Nicholls.
 - (c) Adult ringed 21st June 1929, and recovered where ringed 11th May 1930 by J. Chetwood.
 - (d) Adult ringed 3rd March 1929, and recovered where ringed 18th April 1930 by the ringer.
 - (e) Adult ringed 14th April 1929, and recovered where ringed 9th June 1930 by the ringer.
- (9) A Blackbird ringed as a nestling at Addlestone (Surrey) 16th April 1929 by Mr P. A. D. Hollom, and recovered where ringed 24th March 1930 by Mr Minns.

Plant Gall Records for 1931.

Compiled by H. J. BURKILL, M.A., F.R.G.S.

LEPIDOPTERA.

Epiblema tetraquetra Haw. was noted as being very abundant on *Betula pubescens* and *B. verrucosa*, Abrook Common, Epping Forest, and Epsom Downs.

COLEOPTERA.

Vicia cracca L. attacked by *Apion gyllenhali* Kirby in Epping Forest (J. Ross).

Gentiana amarella L. was plentifully galled by a Weevil at Fetcham, and specimens were also seen near Westcott, Surrey, and near Eynsford, Kent. Attempts to breed out the insect have so far not succeeded.

CYNIPIDAE.

Rosa rubiginosa L. and *R. micrantha* Sm. were again seen in West Kent galled by *Rhodites mayri* Schl. *R. spinosissima* L. in its London habitat was heavily galled by *Rh. eglanteriae* Hartig, and also moderately attacked by *Rh. spinosissimae* Giraud. The plant, however, is being trampled out of existence and is hardly likely to survive many more years in that locality.

Centaurea scabiosa L. seems to have been freely attacked by *Aulax rogenhoferi* Wachtl. as numbers of the galls were noted in Surrey and West Kent. *Aulax scabiosae* Gir. was observed at Fetcham, Surrey.

Tragopogon pratense L. galled by *Aulacidea pigeoti* Kieff. was found in Surrey (M. Niblett).

Oak galls were again poor. In the spring *Andricus furunculus* Bjck. seemed to be the one most often found, and in the autumn its alternate form, *A. ostreus* Gir. was fairly plentiful. Both *N. tricolor* Htg. and *N. fumipennis* Htg. were more frequent than usual in Epping Forest. *Andricus fecundator* Htg. was perhaps up to its usual numbers, but the *Dryophantas* were hardly seen except *D. divisa* Htg. *Cynips corruptrix* Schl. was found on Coldharbour Common, Surrey.

CHALCIDIDES.

Agropyron junceum Beauv. galled by *Isosoma graminicola* Gir. was found down the river near Erith.

CECIDOMYIDAE.

Lychnis alba Mill. Flower buds swollen, distorted and remaining closed. Each contained one yellow Cecidomyid larva of a large size. Clandon, Surrey.

Tilia vulgaris Hayne. (1) *Perrisia tiliam volvens* Rubs. Bright red larvae. Margin of leaf thickened, rolled upwards, discoloured; hairy outside, glabrous inside. (2) Margin of leaf rolled up more than the

last, but with no discolouration and no thickening; glabrous inside and out. Contained small white Cecidomyid larvae. (3) Whole leaf crumpled and distorted. In the folds were dull greyish yellow Cecidomyid larvae. All three species found near Polesden Lacey, Surrey.

Rhamnus frangula L. *Contarinia frangulae* Rubs. Hackhurst Downs, Surrey, and Burnham Beeches, Bucks.

Anthyllis vulneraria L. Flower buds undeveloped, internal growth arrested. Light yellow Cecidomyid larvae. Warlingham (R. S. Bagnall) and Coulsdon, Surrey.

Lathyrus pratensis L. *Perrisia lathyri* Kieff. Epping Forest (J. Ross).

Spiraea filipendula L. Flower buds enlarged, unopened, brighter coloured than normal, containing one or more bright crimson red larvae, and accompanying them in some of the galls smaller yellow larvae. Clandon Downs, Surrey.

Crataegus monogyna Jacq. Flower buds swollen, unopened, containing (1) pinkish larvae. Abundant, Bookham Common. (2) Light yellow larvae, becoming orange yellow on exposure to light. Bookham Common.

Pimpinella saxifraga L. (1) *Lasioptera carophila* F. Loew. (2) *Trotteria umbelliferarum* Kieff. Both Epsom Downs.

Peucedanum sativum Benth. & Hook. *Macrolabis corrugans* F. Loew. Near Westcott, Surrey.

Coriandrum sativum L. *M. corrugans* F. Loew. Surrey (M. N.).

Cornus sanguinea L. Flower buds swollen, unopened, green or greenish in colour, multilarval, containing either (1) white larvae, very active jumpers, Clandon and Fetcham, or (2) pale yellow larvae, not jumping, Fetcham.

Sambucus nigra L. (1) *Schizomyia nigripes* F. Loew. (2) *Arnoldia sambuci* Kieff. (3) *Contarinia lonicerearum* F. Loew.

Galium verum L. Cecidomyid sp. (Houard 7372. Bagnall & Harrison, 1917. See *Trans. L.N.H.S.*, 1917.) Banstead (J. R.). Also seen several times on *G. mollugo* L.

Solidago virgaurea L. Orange yellow larvae, in the flower buds, gregarious. Surrey (M. N.).

Chrysanthemum leucanthemum L. *Rhopalomyia hypogaea* F. Loew. Kent (R. S. Bagnall).

Artemisia absinthium L. Heads of plants stunted with stalks shortened and the leaves all bunched together into tufts. At the bases of the leaves numbers of orange Cecidomyid larvae which pupate in white cocoons at the same place. The midges emerge in a few days. The female has a blackish head and thorax with orange red abdomen. The male is smaller and has the abdomen almost white. Several plants near Abbey Wood, Kent, 5th September.

Senecio jacobaea L. Base of flower heads swollen to twice the normal size, light green, fleshy, with a cavity at the base of the florets containing several white larvae, jumping. Fetcham.

Cnicus arvensis Hoffm. Flower heads twisted, remaining closed at the top, but a few florets break through the side of the head. Inside

are bright red larvae. Uni- or multi-larval. Very frequent, Bookham Common and neighbourhood (Bagnall and H., 112).

C. palustris Willd. Similar galls, Bookham Common.

Hieracium vulgare (Tausch). Flower heads distorted, twisted, and aborted. Multilarval. Orange red larvae. Coulsdon.

Leontodon hispidum L. *Cystiphora leontodontis* Kieff. Surrey (M. N.).

Sonchus asper Hill. *Contarinia sonchi* Kieff. Heads bent over containing a number of leaping larvae, white in the gall, but turning yellow on exposure to light. Bookham (Houard, 6097).

Ligustrum vulgare L. Flower buds slightly swollen, unopened. Clear yellow larvae, not jumping (B. & H., 228 A). *Schizomyia ligustri* Rubs. Albury Downs. (2) Similar galls containing orange yellow larvae. Surrey (M. N.).

Solanum dulcamara L. *Contarinia solani* Rubs. Hitherto only found late in the year. Now known to be double brooded, as galls were found 30th May, on Bookham Common (B. T. Ward); 18th July, at Burnham Beeches, and 22nd August, Pickett's Hole, Surrey.

Scrophularia nodosa L. *Stictodiplosis scrophulariae* Kieff. Surrey (M. N.).

Thymus serpyllum L. *Janetiella thymicola* Kieff. Surrey (M. N.).

Ulmus montana Stokes. (1) *Oligotrophus ulmi* Kieff. was plentiful in the autumn, and very conspicuous when the leaves turned yellow as the gall remained bright green. (2) A similar smaller gall with a light green larva which pupated in the gall. Fetcham.

Betula alba L. *Contarinia betulicola* Kieff. Plentiful in Epping Forest (J. R.).

Corylus avellana L. (1) Catkins swollen containing yellow larvae. *Oligotrophus* sp. January, Fetcham. (2) White larvae on the under surface of the lamina; recorded from Shropshire, 1929. Plentiful in some places in Surrey this year. (3) A different species in a similar position, but causing a much larger gall with an irregular outline. Headley, Surrey.

Quercus robur L. Circular gall in lamina of leaf. Surrey and Kent.

Q. cerris L. Leaf buds unopened, aborted, containing one or more minute almost transparent white larvae. Ranmore Common.

Salix purpurea L. Catkin buds aborted and discoloured. One or more orange larvae. Barnes.

Populus tremula L. *Harmandia globuli* Rubs. This gall which was recorded by Mr L. B. Hall (*Trans. L.N.H.S.*, 1917) was very plentiful this year on Bookham Common. It was also noted on Epsom, Abrook, and Coopersale Commons.

Carex vulpina L. *Perrisia muricatae* Meade. Bookham Common.

C. goodenowii Gay. *Hormomyia rosenhaueri* Rubs. Broadmoor, Surrey (R. S. B.).

Juniperus communis L. *Oligotrophus panteli* Kieff. Westmorland (J. C. Robbins).

Pteris aquilina L. *Perrisia pteridicola* Kieff. Epping Forest (J. R.).

MUSCIDAE.

Acer campestre L. The leaf gall mentioned last year was seen this year near Headley, three miles away from the previous spot.

Aster tripolium L. *Paroxyna plantaginis* Halid. Near Erith.

Senecio vulgaris L. *Sphenella marginata* Fallen. At Burford Bridge, Surrey (M. N.), and near Abbey Wood.

S. aquaticus Hudson. *S. marginata* Fallen (J. Ross).

Populus tremula L. *Melanagromyza simplicioides* Hendel, has been noted in various places.

Agropyron repens Beauv. *Chlorops taeniopus* Meigen. Fetcham.

THRIPSIDAE.

Gentiana amarella L. Leaves twisted, and flower shoot aborted. (1) *Thrips dilatatus*, Westcott, and Coulsdon.

ERIOPHYIDAE.

Spergula vulgaris Boenn. *Eriophyes* sp. Buds and leaves deformed. West Hants (L. B. Hall).

Melilotus alba Desr. *Eriophyes* sp. (Houard, 3537), Essex (R. S. B.).

Achillea ptarmica L. *Eriophyes* sp. Margins of leaves rolled upwards. Surrey.

Campanula glomerata L. *Eriophyes schmardae* Nal. and *E. campanulae* Lindroth. Box Hill (M. N.) and Norbury Park.

Gentiana amarella L. *E. Kernerii* Nal. These galls were abundant near Dorking, though very scarce the previous year. Also found on Fetcham Downs.

Teucrium scorodonia L. Galls apparently due to *Phyllocoptes teucarii* Nal. were found in Surrey but no inmates were discovered (M. N.).

Betula pubescens Ehrh. *Eriophyes* sp. Midrib and veins of under surface of leaves densely covered with long white hairs. Broadmoor, Surrey.

Quercus ilex L. *E. ilicis* Can. These galls have now been noticed on the west side of the Mole valley near Mickleham where they have increased rapidly. The mites seem to be active even when the temperature is at freezing point.

Fagus sylvatica L. *Monochetus sulcatus* Nal. Conspicuous in several places this year.

NEMATODA.

Crepis taraxacifolia Thuill. was very abundant on the Downs near Bookham. Some of the plants were severely twisted and contorted owing to the presence of large numbers of Eelworms.

Hieracium vulgare (Tausch). Stem twisted and head aborted. Eelworms. Coulsdon.

Leontodon autumnale L. Stems and flower heads twisted and malformed. Eelworms. Fetcham Downs.

Digitalis purpurea L. A fleshy swelling, 10 mm. × 8 mm., at the base of a leaf stalk. Eelworms of a large size seen in numbers. Fetcham.

Agrostis alba L. *Tylenchus tritici* Bastian. Wimbledon Common.

FUNGI.

Prunus spinosa L. "Witches Broom." Surrey (M. N.).

Sorbus aucuparia L. *Gymnosporangium juniperi* Link. Lincolnshire (Miss E. F. Noel).

Taraxacum vulgare Schrank. *Protomyces pachydermus* (M. N.).

NOTEWORTHY RECORDS OF PLANTS IN THE LONDON AREA MADE IN 1931.

Euphrasia stricta Host. This eyebright, which was found plentifully on Reigate Hill on the occasion of the Botanical excursion on 19th September, is new to our records.

Among plants which must be regarded as casuals, the following are interesting:—*Archangelica officinalis* Hoffm., Thames side near Richmond (Div. 14), seen on Botanical excursion on 27th June; *Geranium pratense* L., found in two localities in Epping Forest (Div. 9) between Chingford and Loughton; *Senecio squalidus* L., in considerable quantities near the Colnbrook bye-pass road (Div. 1).

Papaver lateritium C. Koch. A handsome light terra-cotta poppy, like a perennial *P. dubium* L., which has been known for many years as a garden casual in the Limpsfield and Oxted district (Div. 19), has been identified (by Kew) as this species—a native of Armenia. Nothing is known of its introduction to the district. It appears sometimes on old walls and vegetable plots as well as in gardens.

R. W. ROBBINS, Recorder, Botanical Section.

British Butterflies in 1931.

By H. J. BURKILL, M.A., F.R.G.S.

IN the compilation of these notes I have been much assisted by reports received from Misses E. M. Gibson, C. E. Longfield, and E. M. Miller, and Messrs R. Adkin, E. A. Aris, R. B. Benson, K. G. Blair, J. O. Braithwaite, R. Cyriax, W. J. Fordham, W. E. Gaze, J. D. Gillett, F. D. Greenwood, F. J. Hanbury, T. H. Harriison, G. H. Heath, C. E. Hick, J. B. Hicks, D. L. Lack, C. Nicholson, C. Oldham, M. G. Palmer, E. B. Pinniger, L. B. Prout, R. W. Robbins, G. B. Routledge, G. Talbot, E. H. Wattson, and P. F. Wright, and to them I tender my thanks.

The records range from Cornwall to the Shetlands and from Kent to St Kilda, with notes from South-west Ireland, so that they cover a large area, and nearly all my correspondents emphasise the unfavourable conditions of the season. The promise of some fine days in the spring, when *Pyrameis cardui* L. was in evidence, was not borne out later as the summer months were cold and depressing with a consequent scarcity of insects.

The Whites were mostly reported as being seen in lesser numbers than usual. A few correspondents say of *Pieris brassicae* L. that it was common, but these are exceptional. Dr W. J. Fordham states that the larvae were heavily parasitised in 1930, with a consequent decrease in the species in 1931, in the district east of York. Mr E. B. Pinniger, however, records that in the autumn of 1930 he collected 63 larvæ from one Brussels Sprout plant at Epping and from these 45 butterflies emerged in the spring, and he saw no parasites. Miss Longfield in County Cork says the species was numerous in August.

P. rapae L. was less plentiful than usual, in fact "scarce" in some localities, while *P. napi* L. was mostly said to be the commoner of the two, though it was not generally abundant. *Euchloe cardamines* L. was reported as being prominent in the spring, and was evidently in larger numbers than usual in the home counties. *Leptosia sinapis* L. was recorded as "fairly abundant in a wood in Herefordshire" (E.M.G.), and one was seen at Beer, South Devon (K.G.B.).

Colias hyale L. was reported once from Surrey (E.B.P.), while *C. croceus* Fourc. (*edusa* F.) was seen several times in the early summer near London, but it does not seem to have been able to breed, and though specimens turned up in various places later on in the South they were probably freshly arrived immigrants. Mr Hanbury recorded several seen in South-west Ireland, and Miss Longfield saw one in good condition, Co. Cork, 9th September. Mr Blair reports one var. *helice* seen in the Isle of Wight, and Mr J. B. Hicks one at Worbarrow Bay, Dorset. *Gonepteryx rhamni* L. was seen fairly frequently in the spring by several correspondents, and four of these report it again as common in the autumn.

Limenitis sibylla L. is holding its own near London and has increased in numbers nicely in certain spots. *Polygonia c-album* L. was noted several times in the home counties. Mr E. H. Wattson for the fourth successive year saw a specimen in his garden at Twickenham, while one was reported from Bognor, 25th October (P.F.W.). One specimen of *Eugonia polychloros* L. was seen at Wormley, 6th June (G.T.), one near Oxshott (E.H.W.) and one at Terling, Essex, 5th August (E.M.M.). *Aglais urticae* L. has been most erratic and seems to have vanished from some districts where it is usually plentiful. Mr Hanbury and Mr Adkin in Sussex, Mr C. E. Hick in Berkshire, and Mr Gillett in Essex report the species as being common, while Miss Longfield saw a large new brood on 2nd August in County Cork. Others report it as very scarce. Though I live on the North Downs and get out further afield most week ends, I only saw a few in the spring and then none until 3rd October, when a solitary specimen flitted along the railway line near Loughboro' Junction. *Vanessa io* L. was generally "not common," but seems to have been more plentiful in a few places. *Pyrameis cardui* L. was noticed in many places in the spring but it seems as if the resultant larvae were only able to feed up to maturity in a few areas, the majority going under to the weather. Most of the imagines seen later seem to have been immigrants, of which there was probably a steady flow from the Continent. Mr Palmer reported it as very common and the larvae as plentiful near

Ilfracombe, which was evidently one of the favoured spots for breeding, since only a few were seen in Cornwall (C.N.). Miss Longfield reported a large arrival in perfect condition, 6th, 7th, and 10th September in County Cork. Mr C. Oldham saw others in South-west Ireland in August, and some near Land's End in October, and in the Shetlands in July. Mr D. L. Lack says "while on St Kilda this year from July 22nd to August 13th we constantly saw Painted Ladies, often three or four in a day. *Pyrameis atalanta* L. was also scarcer than usual. Miss Longfield says "Many in perfect condition, 6th to 10th September," and Mr Hanbury says "Common at East Grinstead," but other observers report a reduction in numbers. Mr D. L. Lack records one caught on St Kilda.

Of the Fritillaries, *Dryas paphia* L. was seen in various localities and was observed near London in some numbers. *Argynnis cydippe* L. and *A. aglaia* L. were reported by a few correspondents. *Brenthis euphrosyne* L. was fairly common in the early summer, and I saw a number on one portion of Ranmore Common on 6th June. *B. selene* L. was reported as fairly common also. *Melitaea athalia* Rott. was recorded from Kent, but not abundant (E.M.G.). Mr Blair noted young larvae of *M. cinxia* L. as being scarce in the Isle of Wight, while he saw plenty of *M. aurinia* Rott. in Devonshire.

Melanargia galatea L. is only mentioned by two correspondents, Mr Adkin saying it is still common in its usual haunts, while Mr Hick saw it swarming on the cliffs of South Devon. *Hipparchia semele* L. was plentiful in places, while *Pararge egeria* L. varied from "a few" to "very abundant." *P. megaera* L. perhaps not so plentiful as in the previous year, and the same may be said of *Epinephele jurtina* L. *E. tithonus* L. generally common, as was *Aphantopus hyperanthus* L. *Coenonympha tiphon*, var. *scotica* Staudinger, was extremely common on the moors in Sutherland in late July and early August (J.B.H.). *C. pamphilus* L., though abundant in some places, seems to have been much less so in many others, especially in the West of England.

Zephyrus betulae L. larvae found at Selborne by Miss Gibson were not easy to rear, the mortality being large. *Z. quercus* L. was not up to usual numbers, while *Thecla w-album* Knoch. was plentiful near Clandon. *Callophrys rubi* L. was seen along the Surrey and Hampshire Downs. *Chrysophanus phlaeas* L. was patchy, most correspondents reporting it as scarce, while it was not seen at all near Truro (C.N.).

Plebius aegon Schiff. was common in a few places. *Aricia medon* Esp. very scarce (E.M.G.), *Polyommatus icarus* Rott. seen less than usual, *Agriades coridon* Pod. locally in good numbers, *A. bellargus* Rott. about but not very many noted, *Celastrina argiolus* L. common in places but few seen in the Epping Forest district. *Cupido minimus* Fuesl. plentiful in one spot on the Hampshire Downs (E.M.G.), and also seen by the Society near London. *Nemeobius lucina* L. was not as numerous as it used to be on the North Downs.

Hesperia malvae L. fairly plentiful, *Nisoniades tages* L. a few, *Adopaea flava* very common in Essex (J.D.G.) and seen elsewhere. *Agriades comma* L. seen in profusion near Eynsford (F.D.G.) and *A. sylvanus* Esp. generally plentiful.

Heterocera Notes, 1931.

By H. J. BURKILL, M.A., F.R.G.S.

THE chief feature of the year among the Sphingidae seems to have been the appearance of *Phryxus livornica* Esp., which was noted from various places many miles apart. Mr K. G. Blair reports having seen four specimens, while Miss Longfield obtained two black-coloured larvae in a bed of *Antirrhinums* in County Cork. Mr T. H. Harrison records *Hyloicus pinastri* L. from East Anglia. *Macroglossa stellatarum* L. was seen on the wing in Cornwall (C. Nicholson), at Witley (W. Hawker Smith), and Oxted (H.J.B.). Its larvae were also taken on *Galium Mollugo*. Other Sphingid larvae have hardly been up to the usual numbers, except that Miss E. M. Gibson reports *Smerinthus ocellatus* L. and *Sphinx ligustri* L. as plentiful in Hants. Mr C. Nicholson lists *S. ocellatus*, *Acherontia atropos* L., *S. ligustri*, and *Chaerocampa elpenor* L. for Cornwall. Dr W. J. Fordham only came across one larva of the last named species on Allerthorpe Common, Yorks, where it is usually not uncommon. I saw none where I had found several the previous year. *Metopsilus porcellus* L. was taken on the North Downs in June, just freshly emerged.

Most correspondents say that the year was a poor one for collecting; sugar failed to attract, and the larvae were not to be seen.

Among those species listed are *Notodonta ziczac* L., *N. trepida* Esp., and *Lophopteryx camelina* L. at Witley (W. Hawker Smith); *Palimpsestis octogesima* Hb. in East Anglia (T.H.H.); *Trichiura crataegi* L. in Hants. (T.H.H.); *Lasiocampa quercus* L., var. *callunae* Palmer, Cornwall (C.N.); *Hipocrita jacobaeae* L., larvae in fair numbers, Yorks. (W.J.F.), but plentiful in Surrey and Kent (H.J.B.). *Acronycta alni* L. was taken at Oxted (R. W. Robbins), *Agrotis vestigialis* Rott. in East Anglia (T.H.H.), *Noctua stigmatica* Hb. in Hants. (T.H.H.), *Tapinostola elymi* Tr. in East Anglia (T.H.H.), *Leucania littoralis* Curt. in East Anglia (T.H.H.), *Cirrhoedia xerampelina* Hb. and *Cirrhia citrargo* L., both Hants, and *Heliothis peltigera* Schiff., Hants., bred from larvae (T.H.H.). This last was found in the larval stage plentifully in North Devon in June, showing that the moths must have been fairly numerous at a little earlier date (K.G.B.). Mr Nicholson also reported larvae in his garden at Tresillian. *Plusia moneta* F. was noted at Witley, the stems of the Delphiniums being eaten to within an inch or two of the ground (W.H.S.). *P. chryson* Esp. was taken in Hants, (T.H.H.), while *P. gamma* L. as an immigrant was common in North Devon in June (K.G.B.); was seen at Frinton on the sea wall, 19th September, in some numbers (Miss E. M. Miller); was abundant in the latter part of the summer (R.W.R.); was noted, but not in any great swarms (L. B. Prout), and was said to be fairly common after 2nd August (C.N.). *Catocala nupta* L. seems to have been about in some numbers:

in the autumn in Essex (W. E. Gaze and H.J.B.) and Surrey and Kent (H.J.B.). *Acidalia rubiginata* Hufn. and *Mesotype virgata* Rott. were taken in East Anglia (T.H.H.); *Minoa murinata* Sc., *Lobophora polycommata* Hb., and *L. halterata* Hufn. in Hants, (T.H.H.). Mr Hawker Smith refers to the larvae of *Cheimatobia brumata* L. as being very abundant on roses and fruit trees. The moths were numerous at Leatherhead in December (H.J.B.). *Coremia quadrifasciaria* Cl. was reported from East Anglia, and *Eurymene dolobraria* L. and *Hybernica auran-tiaria* Esp. from Hants, (T.H.H.). *Apocheima hispidaria* F. from Hants, (T.H.H.) and Berks, (C. E. Hick). The last-named correspondent states that it was more common than he had ever seen it before. He also mentions *Pachys stratiaria* Hufn. as coming commonly to light. Mr Prout mentions *Nomophila noctuella* Schiff. as a migrant from overseas, but Mr Blair states that he failed to observe it in the Isle of Wight in September.

Mr F. J. Hanbury mentions *Zygaena hippocrepidis* Stph. as being present in his garden in hundreds in June and July.

Among the Sesidae Mr Nicholson records *Sciapteron tabaniforme* Rott. (*Trochilium vespiforme* Westw.) from Probus, Cornwall. Mr E. A. Aris took *T. crabroniformis* Lew. in Kent, while I saw several freshly emerged *Sesia spheciforme* Gern. near Wisley.

Mr J. B. Hicks records a case of a *Dicranura vinula* L., found in 1929 in the larval state, remaining as a pupa until 15th June 1931, when a normal female moth emerged.

Mr P. F. Wright gives an instance of the vitality of *Arctia villica* L. Two specimens, a male and a female, were taken a few yards apart on a Saturday in 1930. Both were in perfect condition, and were promptly placed in the Cyanide bottle. They were there for some hours, and were set the next day. On the Monday the female came to life again and laid a number of ova on the setting board. In due course the eggs hatched, and a large number of larvae fed up and hibernated. Unfortunately, early in 1931 all died except one, which duly reached the pupa stage.

Mr Hawker Smith, when out with the Entomological Section in July, took a larva of *Hypena proboscidalis* L. which proved to be very heavily attacked by parasites, as fifty Ichneumonidae emerged later on from the pupa.



SPIRÆA, Linn. 114.

469. **S. Ulmaria**, Linn. *Meadowsweet*.

Common, but not yet recorded from divisions 16, 18, 21 and 22.

Var. b. *denudata*, Bœnn.

Divisions 4, 13, 15. Probably to be found elsewhere.

470. **S. Filipendula**, Linn. *Dropwort*.

3. Hampton Court, on the tow-path. 17. Fetcham Downs. Mickleham Downs. Banstead Downs. Chipstead. Near Reigate. 18. Riddlesdown. Farthing Downs. 22. Darenth.

RUBUS, Linn. 115.

Sub-section 1. IDÆI.

471. **R. idæus**, Linn. *Raspberry*.

Frequent in divisions 4, 17, 18, 19 and 20. Also recorded from 3, 6, 7, 9, 13, 14 and 24.

Var. b. *obtusifolius*, Willd.20. Barnet Woods, Hayes (*Lon. Nat.*, 1927, p. 12).Sub-section 2. FRUTICOSI. *Bramble*. *Blackberry*.

Brambles are generally distributed and abundant throughout the area, but the difficulties of identification in this complex and puzzling group have deterred all but a very few of our members from attempting to record them, and many districts have had scarcely any attention. Division 20 (Blackheath) has been well worked, and to a lesser extent divisions 14 (Wimbledon) and 19 (Holmesdale). The commons to the S.W. of London are rich in brambles, only a part of which have yet reached our records. Thanks are due to William Watson, of Bickley, for assistance in compiling the list which follows. A large part of the records have been confirmed by him.

472. **R. fissus**, Lindl.

20. Plentiful at Chislehurst Common, Pauls Cray Common and Petts Wood.

473. **R. suberectus**, Anderss. (**R. nessensis**, Hall).

20. Hayes Common. Petts Wood.

474. **R. Rogersii**, Linton.

2. Denham Golf Links (H.J.R.). 20. Farnborough Common. Keston. Hayes Common.

476. **R. plicatus**, Wh. & N.

13. Walton Common. Abrook Common. 14. Barnes Common. Sheen Common. 19. Limpsfield High Chart. Reigate Heath. 20. Petts Wood. Pauls Cray Common.

477. **R. opacus**, Focke, var. **nobilis** W. Watson (**R. nitidus** var. **anglicanus** Sudre).

13. Abrook Common. Littleworth Common.

479. **R. affinis**, Wh. & N.

14. Barnes Common. Wimbledon Common.

482. **R. holerythros** Rogers non Focke.

20. Hayes Common. Pauls Cray Common. Keston Common.

484. **R. imbricatus**, Hort.

b. *londinensis*, Rogers.

13. Weybridge Common. 14. Barnes Common. Wimbledon Common. 16. Addington Hills. Tooting Common. 20. Pauls Cray Common. Bostall Heath.

486. **R. carpinifolius**, Wh. & N.

13. Weybridge. 14. Barnes Common. Wimbledon Common. 15. Epsom Common. 16. Headley Heath. Burgh Heath. 20. Hayes Common. Chislehurst Common.

Widespread in Surrey.

488. **R. Lindleianus**, Lees.

7. Hadley Wood. Enfield Chase. 14. Wimbledon Common. 16. Tooting Common. 19. Reigate Heath. Tilburstow. Limpsfield Common. 20. Bromley.

Commoner than the above records suggest.

489. **R. argenteus**, Wh. & N.

(The correct identification of the bramble so named, in this area, is most often *R. alterniflorus* M. & L., *fide* W. W.).

19. Limpsfield Common, abundant. 20. Bromley.

491. **R. rhamnifolius**, Wh. & N., sub-sp. **cardiophyllus** L. & M.

9. High Beach, Epping Forest. 16. Tooting Common. 20. Bromley.

Common in Surrey and Kent.

492. **R. Bakeri**, F. A. Lees.

14. Barnes Common. 16. Tooting Common. 20. Chislehurst Common.

494. **R. Scheutzii**, Lindeb.

16. Tooting Common, in small quantity; an old recorded station.

495. **R. dumnoniensis**, Bab.

13. Fairmile Common. Walton Common.

496. **R. polyanthemus**, Lindeb. (**R. pulcherrimus**, Neum.).

9. High Beach, Epping Forest. 17. Headley Heath. 19. Limpsfield. 20. Bromley.

500. **R. villicaulis**, Koehl.

9. Epping Forest—Fairmead Bottom, High Beach and Monks Wood. 13. Weybridge Common. 14. Sheen Common. 20. Hayes Common.

Var. b. *calvatus*, Blox.

16. Addington Hills. 18. Near Selsdon.

501. **R. Selmeri**, Lindeb.

20. Hayes Common. Farnborough Common. Said to be frequent in the southern part of the radius.

502. **R. laciniatus**, Willd. "*American Blackberry*."

13. Weybridge Heath. Sandpit on Oxshott Heath. 14. Barnes Common. 16. Tooting Common. 20. Chislehurst. Abbey Wood. 24. Crockham Hill.

Garden escape, of unknown nativity; must be of European, and perhaps of British origin as the earliest record of it is in Plukenet's *Phytographia*, parts i and ii (1691).

503. **R. rhombifolius**, Weihe.

9. Epping Forest, near Walthamstow. 13. Littleworth Common. 17. Walton Common. 20. Chislehurst Common. 22. Dartford Heath.

504. **R. gratus**, Focke.

14. Putney Heath. 17. Burg's Heath. 20. Chislehurst. Eltham Common. Bostall Heath.

† **R. Brittoni**, Rogers & Riddelsdell.

13. Esher, Walton and Weybridge Commons. 16. Tooting Common. 20. Pauls Cray Common. Farnborough Common. Hayes.

Recently described and acknowledged to be distinct from *R. ramosus*, Briggs, with which it was formerly confused.

508. **R. Godroni**, Lec. & Lam. (**R. Winteri**, Focke) var.

18. Downs above Oxted. 19. Limpsfield Common. 20. Chislehurst Common. Southborough (Bromley).

509. **R. rusticanus**, Merc. (**R. ulmifolius**, Schott.).

Records from divisions 7, 8, 9, 13, 15, 17, 18, 19, 20, 21 and 24. But it probably occurs in all, being ubiquitous except on siliceous soils.

510. **R. pubescens**, Whe.

Var. b. *subinermis*, Rogers.

9. Epping Forest, near Connaught Water. 17. Woods between Chipstead and Banstead. 18. Old chalkpit, Limpsfield. 19. Limpsfield Common. Barrow Green Woods. Itchingwood Common. 20. Chislehurst Common.

513. **R. lentiginosus**, Lees.

14. Wimbledon Common. 20. West Wickham. Hayes Common. Keston. Chislehurst.

(W. W. considers this plant to be distinct from the original *R. lentiginosus*, and has described it in *B.E.C. Report*, 1928, as *R. nitidioides*, spec. nov.).

514. **R. macrophyllus**, Wh. & N.

14. Putney Heath. 20. Shooters Hill. Lessness Woods.

(38) **BOTANICAL RECORDS OF THE LONDON AREA.**

518. **R. Colemanni**, Blox.

14. Barnes Common. Wimbledon Common.

519. **R. Sprengelii**, Whe.

9. Near High Beach Church. 19. Limpsfield Chart Woods. 20. Near Bromley. 24. Crockham Hill.

† **R. leucotrichus**, Sudre.

16. Addington (near). Tooting Common. 17. Park Down, Chipstead. 19. Reigate. 20. Holwood. Farnborough. 24. Kent Hatch, Crockham Hill.

524. **R. pyramidalis**, Kalt.

9. Epping Forest, south-east of High Beach. 19. Limpsfield Common and Chart. 20. Hayes Common. Bostall Heath.

525. **R. leucostachys**, Sm. (**R. vestitus** Wh. & N.).

This widespread and dominant species has been recorded from divisions 4, 8, 9, 14, 18, 19 and 20, but is likely to be found in many others, if not in all.

Var. *b. macrothyrsus*, Lange.

19. Limpsfield Common. 20. Frequent on the Commons. 24. Crockham Hill.

526. **R. lasiocladus**, Focke.

Var. *b. angustifolius* Rogers.

9. Epping Forest, north of Almshouse Plain. 14. Putney Heath.

† **R. poliocladus**, Watson ("B.E.C. Report," 1928).

9. Epping Forest.

532. **R. cinerosus** Rogers.

13. Oxshott. 14. Wimbledon. 16. Streatham. 20. Frequent.

536. **R. apiculatus**, Wh. & N. (**R. anglosaxonicus**, Gelert).

14. Coombe Wood. 19. Limpsfield Chart.

Var. *d. raduloides*, Rogers.

14. Barnes Common. 16. Tooting Common. 20. Near Bromley. 22. Dartford Heath.

538. **R. infestus**, Whe.

20. Farnborough Common. Hayes Common.

539. **R. uncinatus**, P. J. Muell.

16. Tooting Common, a single plant, by the pond. 19. Stone quarry, Limpsfield Chart.

541. **R. Drejeri**, G. Jensen.

19. Limpsfield Chart, stone quarry.

Var. *b. Leyanus*, Rogers.

20. Eltham, in fair quantity, 1931.

542. **R. radula**, Whe.

13. Littleworth Common.

Var. b. *anglicanus*, Rogers.

14. Barnes Common. 20. Near Bromley.

Var. c. *echinatoides*, Rogers.

Rather frequent in 13, 14, 16 and 20.

543. **R. echinatus**, Lindl. (**R. discerptus**, P. J. M.).

9. High Beach, Epping Forest. 18. Chelsham. 19. Limpsfield Common. 20. Bostall Heath. 22. Puddledock and Bexley.

544. **R. rudis**, Whe.

14. Coombe Wood. 17. Howe Green. Lane above Park Down, Chipstead. 20. Near Bromley. 22 and 23. Rather frequent in woods on the Downs.

545. **R. cenomanensis**, Sudre.

20. South of Shooters Hill.

547. **R. podophyllus**, Rogers (non Muell.).

20. South of Shooters Hill.

548. **R. Griffithianus**, Rogers.A form very like *R. Griffithianus* (referred to in the *Handbook of British Rubi*) is frequent on heaths in divisions 14, 16 and 20.550. **R. melanodermis**, Focke.

14. Fairly plentiful on Wimbledon Common.

551. **R. Babingtonii**, Bell-Salt.

14. Wimbledon. 20. Chislehurst Common. Petts Wood. Farnborough. Hayes.

552. **R. festivus**, Rogers (non M. & W.).

13. Littleworth and Abrook Commons in plenty, and elsewhere in that neighbourhood. 14. Park Side, Wimbledon Common.

† **R. thyrsiflorus**, Weihe.

14. Putney Heath and Wimbledon Common. A recent addition to the British list.

558. **R. fuscus**, Wh. & N.Var. b. *nutans*, Rogers.

13. Oxshott. 17. Burgh Heath. 20. Chislehurst Common. Bostall Heath.

Var. c. *macrostachys*, Rogers (non Muell.).

9. Fairmead, Epping Forest. 20. Near Bromley. 23. Higham's Hill.

559. **R. pallidus**, Wh. & N.

2. Denham Golf Links. 20. Bostall Heath. Chislehurst. Shooters Hill.

Var. *b. leptopetalus*, Rogers.

9. Epping Forest. 14. Wimbledon. 20. Chislehurst Common.
Bostall Heath. Farnborough. 22. Row Hill.

560. *R. glareosus*, Rogers & Marshall.

22. Shoreham. 24. Hosey Common. Crockham Hill.

562. *R. rosaceus*, Wh. & N.

9. Leppitt's Hill and near High Beach. 17. Howe Green. 18.
Frith Wood, Chelsham. 19. Limpsfield Common. 20. Nash. Hayes.
Chislehurst.

566. *R. longithyriger*, Bab.

1. Black Park. 20. Crown Wood. Queen Wood. Shooters Hill.

568. *R. foliosus*, Wh. & N.

9. Parndon Wood. 19. Limpsfield Common. 20. Petts Wood.
Hayes. Chislehurst.

569. *R. hystrix*, Wh. & N.

Var. *c. infecundus*, Rogers.

7. Near Broxbourne. 9. Epping Forest. 20. Near Bromley, abundantly. 22. Row Hill.

Var. *d. adornatus*, Rogers (non Muell.).

14. Wimbledon. 16. Tooting. 20. Hayes. Keston. Eltham.

Var. *e. Powellii*, Rogers.

9. Epping Forest. 20. Abbey Wood.

† *R. horridus*, Hartmann

18. Between Addington and Chelsham; new to Britain. Hitherto mistaken for *R. fusco-ater*, Weihe.

572. *R. Kæhleri*, Wh. & N.

9. Fairmead, Epping Forest. 24. Crockham Hill.

† *R. spinulifer*, M. & L.

20. Bostall Heath. 22. Bexley Wood.

A rather frequent British bramble until recently thought to be *R. Kæhleri*.

† *R. apricus*, Wimmer.

14. Wimbledon Common. 20. Chislehurst Common, in several parts.

573. *R. dasyphyllus*, Rogers.

9. Epping Forest, near Forest Lodge. 14. Barnes. Wimbledon.
20. Near Bromley. Chislehurst. Hayes. 23. Halstead.

575. *R. Marshalli*, Focke & Rogers.

20. Bostall Wood.

576. *R. viridis*, Kalt.

17. Field by Banstead Wood. 22. Row Hill.

581. **R. hirtus**, Waldst. & Kit.

Var. c. *Kaltenbachii*, Rogers (non Metsch). (*R. diversus*, W. Watson.)

18. Frith Wood, Farley (mistaken for *R. Bellardii* in *Fl. Surrey*).

20. Abbey Wood, south of Shooters Hill. Hayes. Chislehurst.

586. **R. dumetorum**, Wh. & N.

Recorded from divisions 8, 9, 17, 18, 19, 20 and 24, as sp. coll. Probably widely distributed. The form most frequently noted appears to be *ferox*, Whe., but *britannicus*, Rogers, and *tuberculatus*, Bab., are also common.

587. **R. corylifolius**, Sm.

Divisions 19, 20 and 21 as sp. coll. Var. a. *sublustis*, Lees, in divisions 2 and 19.

588. **R. Balfourianus**, Blox.

13. Weybridge. Abrook. 14. Wimbledon Common. 19. Limpsfield, commonly. 20. Bromley. Farnborough. Petts Wood. Between West Wickham and Addington.

590. **R. cæsius**, Linn. *Dewberry*.

Reliable records of the Dewberry in divisions 8, 17, 18, 19, 20 and 23 refer to the plant in approximately typical form. Hybrids of this and other Rubi have been ignored as too uncertain for record.

GEUM, Linn. 117.

594. **G. urbanum**, Linn. *Avens*.

Found freely in every division.

FRAGARIA, Linn. 118.

596. **F. vesca**, Linn. *Wild Strawberry*.

No records from divisions 6, 8, 13, 14 and 21. Surely present in some. if not in all.

POTENTILLA, Linn. 119.

598. **P. norvegica**, Linn.

4. Kingsbury. Uxbridge. 6. Winchmore Hill. Southgate. 8. Clapton. 11. Romford. 15. Carshalton.

An established alien in places. Europe.

599. **P. sterilis**, Garcke (**P. Fragariastrum** Ehrh.). *False Strawberry*. Generally abundant, but not recorded from 14, 16, 21 and 22.

602. **P. erecta**, Hampe. *Tormentil*.

All divisions except 3 and 21.

603. **P. procumbens**, Sibth.

Recorded in scattered localities from all southern divisions (13-24) except 21 and 23. No records N. of the Thames, but possibly some recorders in that area have confused *P. procumbens* and *P. erecta*.

(42) BOTANICAL RECORDS OF THE LONDON AREA.

604. **P. reptans**, Linn. *Cinquefoil*.

In all divisions.

605. **P. Anserina**, Linn. *Silverweed*.

In all divisions.

609. **P. argentea**, Linn.

Sparingly recorded from divisions 2, 4, 5, 6, 9, 14, 17, 18, 19 and 21, and more freely from 7, 12 and 20.

ALCHEMILLA, Linn. 120.

613. **A. arvensis**, Scop. *Parsley Piert*.

In all divisions except 16 and 21. Probably in all.

615-622. **A. vulgaris**, Linn. (agg.). *Lady's Mantle*.

2. Near Croxley Green. Bricket Wood Common. Rousbarn Lane.
7 Between Potters Bar and Northaw. 24. Near Mariners' Hill, Westerham.

The modern segregates to which the above records refer have not been determined.

AGRIMONIA, Linn. 121.

627. **A. Eupatoria**, Linn. *Common Agrimony*.

In all divisions except 20, which is surely an oversight.

628. **A. odorata**, Mill.

7. Cuffley. 13. Oxshott Heath, near Steer Lane. 15. Wood near Banks Common. Step Lane, Oxshott. 17. Edge of Nower Wood, Headley. 19. Limpsfield. 20. South side of Petts Wood.

POTERIUM, Linn. 122.

629. **P. Sanguisorba**, Linn. *Salad Burnet*.

In divisions 1, 2, 3, 4, 7, 13, 14, 16, 17, 18, 19, 20, 22 and 23. Most plentiful in the southern chalk districts 17, 18 and 23.

631. **P. officinale**, A. Gray. *Great Burnet*.

1. Thorney. 4. Whitchurch. Hendon. Edgware. Kingsbury. Near Uxbridge.

This species, absent from Kent and Essex and extremely rare in Surrey, is evidently still well distributed in W. Middlesex, where it was first recorded as a British plant in 1548.

ROSA, Linn. 123.

Arrangement and nomenclature is that now adopted by Lt.-Col. A. H. Wolley-Dod, in "A Revision of the British Roses"—Supplement to *Journal of Botany*, November 1930, *et seq.*

In the main this follows *London Catalogue*, 11th Edition, but there are some important modifications. (It is now issued as a Reprint, by Taylor and Francis, Red Lion Court, Fleet Street, E.C.4. Price 3/6, post free.)

The records published herewith are obviously quite inadequate and can only be regarded as preliminary to a much fuller list. It is hoped that more members of our Society will become students of this fascinating genus. July and August are the best months for collecting, it being essential that fruit shall be at least fairly well formed, the flowering period being usually too early for such condition. It is desirable that specimens be about 16 inches by 10, and that each gathering shall contain at least 10 fruits. Specimens (with full data as to locality, time of gathering, etc.) sent to Mr E. B. Bishop, Lindfield, Marshall Road, Godalming, will be named to the best of his ability, and in cases of serious doubt (when deemed to be of sufficient importance) will be submitted to Col. Wolley-Dod.

632. **R. arvensis**, Huds.

No northern records prior to 1920. In divisions 1, 3, 4 and 9 only. Southern divisions, all except 13 and 18.

All these are merely recorded as aggregate species, no varieties being given.

636. **R. stylosa**, Desv.

7. Broxbourne (var. c. *systyla* (Bast.) Baker). 17. Mickleham Downs (var. *systyla*, f. *lanceolata*, Lindl.—*fide* A. H. W.-D.). 19. Limpsfield (var. *systyla*).

637. **R. spinosissima** Linn. *Burnet Rose*.

14. Barnes Common (type and var. f. *Ripartii* (Déségl.), *fide* A. H. W.-D.). An old station for *Ripartii*, for which it was until recently the only known British station. Re-discovered by H. J. Burkill, and still there in 1931.

640. × **R. glabra**, W.-Dod.

14. Barnes Common (= *Grovesii*, Baker). An old record. Still there in 1931 (H. J. Burkill).

657. **R. canina**, Linn. *Dog Rose*.

Records (many only as agg.) from 1, 4, 7 (none from Epping Forest!), 14 to 24.

The following forms have been recorded:—

lutetiana, (Lem.) Baker.

4. Near Pinner.

senticosa, (Ach.) Baker (including *Amansii*, (Déségl. & Rip.)).

14. Ham Common (as *senticosa* and as *Amansii*), *fide* A. H. W.-D.

15. Great Bookham Common. Banks Common (as *senticosa* and as *Amansii*), *fide* A. H. W.-D. 17. Leatherhead Downs (as *senticosa* and as *Amansii*).

senticosa, f. *mucronulata*, (Déségl.) W.-Dod.

15. Near Banks Common, *fide* A. H. W.-D.

ramosissima, Rau. (including *curticola*, W.-Dod, non Pug.).

17. Headley Lane (as *curticola*).

dumalis, (Bechst.) Dum., f. *viridicata*, (Pug.) Rouy.

7. Broxbourne. 14. Ham Common, *fide* A. H. W.-D.

stenocarpa, (Déségl.) Rouy.

7. Broxbourne, *fide* A. H. W.-D.

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andegavensis, (Bast.) Desp.

19. Oxted.

verticillacantha, (Mér.) Baker.

17. Epsom Downs.

Blondæana, (Rip.) Rouy, f. *vinacea*, (Baker) Rouy.

15. Near Banks Common, *fide* A. H. W.-D.

660. **R. dumetorum**, Thuill.

(As aggregate, unless otherwise stated.)

3. Hampton Court. 4. Near Pinner. 9. High Beach (var. *incerta* (Déségl.) W.-D., f. *lævistyla*, W.-Dod, *fide* A. H. W.-D.). 13. Abrook Common. 15. Banks Common (agg., also f. *urbica*, (Lem.) W.-Dod, *fide* A. H. W.-D.). 17. Mickleham Downs. 19. Limpsfield Common. Itchingwood Common (f. *urbica*, (Lem.) W.-D.).

663. **R. obtusifolia**, Desv.

Var. *typica*, W.-Dod.

15. Banks Common, and wood near by, *fide* A. H. W.-D.

Var. *tomentella*, (Lem.) Baker.

7. Near Broxbourne, *fide* A. H. W.-D. 14. Ham Common, *fide* A. H. W.-D. 15. Great Bookham Common and Banks Common, both *fide* A. H. W.-D. 19. Limpsfield and Itchingwood Commons.

Var. *tomentella*, f. *canescens*, (Baker) W.-Dod (including *Carionii*, Déségl. & Gill.).

7. Near Broxbourne (as *Carionii*, *fide* A. H. W.-D.). .

669. **R. Sherardi**, Davies.

9. Near High Beach Church. 18. Marden Park (both var. *typica*, W.-Dod, *fide* A. H. W.-D.).

670. **R. tomentosa**, Sm.

17. Chipstead (agg.). 18 and 19. Near Oxted (var. *typica*, W.-Dod, and its f. *eglandulosa*, W.-Dod). 19. Itchingwood Common (var. *pseudocuspidata*, (Crép.) Rouy), *fide* A. H. W.-D.

671. **R. rubiginosa**, Linn. *Sweet Briar*.

17. Box Hill (including var. *typica*, W.-Dod). Recorded as *apricorum*, Rip. 18. Oxted Downs. Riddlesdown. 23. Between Eynsford and Romney Street.

All as agg. only, except first.

672. **R. micrantha**, Sm. *Sweet Briar*.

1. Iver. 7. Near Broxbourne (var. *typica*, Chr., *fide* A. H. W.-D.). 15. Banks Common. Great Bookham Common (var. *typica*, Chr., *fide* A. H. W.-D.). 17. Box Hill. Park Down, Chipstead. 18. Oxted Downs. Riddlesdown. 19. Oxted. Itchingwood Common.

All as agg. only, unless otherwise stated.

SORBUS, Linn. 124.

676. **S. aucuparia**, Linn. *Mountain Ash, Rowan.*

1. Black Park. 6. Highgate Woods. Bishops Wood. Ken Wood.
9. Epping Forest, near High Beach. And in all southern divisions except 15, 21 and 23.

683. **S. Aria**, Crantz. *Whitebeam.*

Plentiful on the chalk in divisions 17, 18 and 23. Also in 19, 20, 22 and 24, and occasional single trees in 6 and 9.

686. **S. torminalis**, Crantz. *Wild Service.*

6. Queens Wood and Coldfall Wood, Highgate. Hampstead Heath.
9. Plentiful in Larks Wood, Chingford. Epping Forest. Near Theydon.
11. Thorndon Park. 20. W. of Grove Park, Chislehurst. 22. Near Southfleet.

PYRUS, Linn. 125.

687. **P. communis**, Linn. *Wild Pear.*

4. Hendon. 9. High Beach. Highams Park. Larks Wood. 14. Between Kew and Richmond, by the river. 19. Lanes at Oxted and Limpsfield. Limpsfield Common. 20. Chislehurst Common.

Doubtfully wild, though some of the above are spiny, small fruited trees.

689. **P. Malus**, Linn. *Crab Apple.*

Recorded from all divisions except 8, 11, 12, 21 and 24.

Var. *b. mitis*, (Wallr.).

9. High Beach, near the Church. 20. Near Orpington.

CRATÆGUS, Linn. 126.

691. **C. Oxyacantha**, Linn. (**oxyacanthoides**, Thuill.).*Hawthorn, May.*

4. Pinner. Between Ickenham and Harefield. 9. Epping Forest.
15. Ashted Common. 17. Wray Common, Reigate. 18. Titsey. 19. Moorhouse. Limpsfield. Reigate. 20. Crofton. Darrack Wood. 23. Pratts Bottom. Otford Mount.

Apparently more frequent in the south, but not always distinguished from the common species in northern records.

692. **C. monogyna**, Jacq. *Hawthorn, May.*

Abundant in all divisions.

COTONEASTER, Medic. 127.

† **C. Simonsii**, Baker.

17. Near foot of Colley Hill, Reigate. On the Ermyn Street between Ashted and Mickleham Downs. 18. South Hawke, Woldingham.

A Himalayan species bird-sown from gardens.

27. SAXIFRAGACEAE.

SAXIFRAGA, Linn. 128.

703. **S. tridactylites**, Linn.

Scattered records in divisions 2, 3, 4, 7, 8, 12, 14, 17, 20, 22 and 23.

706. **S. granulata**, Linn. *Meadow Saxifrage*.

Recorded from divisions 2, 3, 8, 12, 13, 14, 18, 19, 20 and 23. Most frequent in 20, in the Hayes district.

CHRYSOSPLENIUM, Linn. 129.

718. **C. oppositifolium**, Linn. *Golden Saxifrage*.

6. Bishops Wood. 7. Wormley West End. Beaumont. 11. Paine Shaw, Navestock Side. 18. Near Oxted, by a spring from the chalk. 19. Limpsfield. 20. Chislehurst. Crofton. 24. Brasted.

719. **C. alternifolium**, Linn. *Golden Saxifrage*.

19. Marsh near Oxted Mill.

RIBES, Linn. 131.

721. **R. Grossularia**, Linn. *Gooseberry*.

Divisions 2, 3, 7, 15, 17, 18, 19, 20 and 23.

722. **R. alpinum**, Linn.

19. Hedge at Barrow Green, Oxted. Presumably planted.

723. **R. rubrum**, Linn. *Red Currant*.

Divisions 7, 17, 18, 19 and 20.

725. **R. nigrum**, Linn. *Black Currant*.

4. Harefield. 9. Woodridden Hill, Epping Forest. 17. Headley Heath. 19. By the brook, Oxted.

The species of *Ribes* have usually the appearance of casuals.

28. CRASSULACEAE.

SEDUM, Linn. 134.

730. **S. Telephium**, Linn. *Orpine*.

1. Fulmer. 2. Lane by The Durrants. Bricket Wood. Sarratt. 4. Near Harefield chalkpit. 7. Broxbourne. 13. Weybridge. 17. Tadworth. 19. Clackets, near Titsey. Oxted. Reigate Heath. 20. Locks Bottom. 23. Kingsdown.

S. b. *Fabaria*, Koch, has not been recorded.733. **S. album**, Linn. *White Stonecrop*.

5. Wall at Waltham. 19. Walls at Limpsfield.

734. **S. acre**, Linn. *Stonecrop, Wall-pepper.*

3. Hampton Court. 7. Essendon. Cheshunt. 8. Coppermills Reservoir banks. 12. Cranham. Purfleet. And in all southern divisions except 13 and 16.

736. **S. rupestre**, Linn.

19. Churchyard wall, Limpsfield.

738. **S. reflexum**, Linn.

13. Weybridge Heath. 19. Sand quarry, Oxted. Tandridge. 22. Banks at Swanley Junction.

SEMPERVIVUM, Linn. 135.

740. **S. tectorum**, Linn. *Houseleek.*

In divisions 3, 4, 9, 10, 19 and 23. Planted.

29. DROSERACEAE.

DROSEREA, Linn. 136.

741. **D. rotundifolia**, Linn. *Sundew.*

9. Several stations in the northern part of Epping Forest. 14. Wimbledon Common. 20. Keston.

Varies in quantity from year to year.

743. **D. longifolia**, Linn.

9. Has been found in Epping Forest, near the "Wake Arms," 1926.

30. HALORAGACEAE.

HIPPURIS, Linn. 137.

744. **H. vulgaris**, Linn. *Mares-tail.*

2. Rickmansworth. 3. West Drayton. 8. Along the R. Lea from Enfield Lock to St Margarets. 15. Leatherhead Millpond.

MYRIOPHYLLUM, Linn. 138.

745. **M. verticillatum**, Linn. *Water-Milfoil.*

2. Near Denham.

746. **M. spicatum**, Linn.

9. Epping Forest. 17. Headley Heath.

CALLITRICHE, Linn. 139.

748. **C. vernalis**, Koch.

Recorded from divisions 1, 3, 6, 7 and 9, but the identification is doubtful.

749. **C. stagnalis**, Scop.

4. Ruislip. 5. Totteridge. 7. Essendon. 13. Oxshott Heath. 14. By the R. Thames near Kew. 15. Carshalton. 18. Botley Hill, Titsey. 19. Limpsfield Chart. 20. Hayes.

751. *C. intermedia*, Hoffm.
13. Near Weybridge.

752. *C. obtusangula*, Le Gall.
19. Limpsfield brook. 21. Stone Marshes.

31. LYTHRACEAE.

PEPLIS, Linn. 140.

755. *P. Portula*, Linn. *Water Purslane*.
Recorded from divisions 1, 4, 5, 7, 9, 13, 14, 17, 19 and 20.

LYTHRUM, Linn. 141.

756. *L. Salicaria*, Linn. *Purple Loosestrife*.

Frequent along the Rivers Thames, Colne, Brent and Lea in divisions 1, 2, 3, 4, 8, 12, 13, 14 and 15. Also the following, 6 and 7. Near Enfield. 20. Petts Wood. 24. Westerham.

32. ONAGRACEAE.

EPILOBIUM, Linn. 142. *Willow-herb*.

758. *E. angustifolium*, Linn. *Rose-bay*.
In all divisions except 12 and 23, where it is probably present.

759. *E. hirsutum*, Linn. *Great Willow-herb*.
Not recorded from the chalk divisions 18 and 23. Plentiful elsewhere.

760. *E. parviflorum*, Schreb.
All divisions except 13, 14, 16, 18, 22 and 23.

761. *E. montanum*, Linn.
All divisions except 5, 12, 13 and 21.

763. *E. lanceolatum*, Seb. & Maur.
20. Bickley.

764. *E. roseum*, Schreb.
1. Fulmer. 4. Ickenham. Denham. 5. South Mimms. 8. Railway bank, Clapton. 20. Chislehurst. Southend, by Bromley.

765. *E. tetragonum*, Curt.
4. Eastcote. 9. Hale End. 13. Abrook. 15. Banks Common.
19. Limpsfield. 20. Bickley.

766. *E. obscurum*, Schreb.
1. Fulmer. 4. Stanmore Heath. Edgware. 6. Bishops Wood.

768. *E. palustre*, Linn.
Recorded in divisions 5, 6, 7, 9, 10, 11, 14, 19 and 24.

CENOTHERA, Linn. 144.

772. *Æ. biennis*, Linn. *Evening Primrose*.

This conspicuous garden escape has been recorded from 3, 5 and 9 on the north side, and all the southern divisions except 14 and 23.

CIRCÆA, Linn. 145.

776. **C. lutetiana**, Linn. *Enchanter's Nightshade*.

All divisions except 3, 12, 14, 16, and 21.

33. CUCURBITACEAE.

BRYONIA, Linn. 146.

778. **B. dioica**, Jacq. *White Bryony*.

Recorded from all divisions except 24 (Westerham), where it is certainly present.

34. UMBELLIFERAE.

HYDROCOTYLE, Linn. 147.

779. **H. vulgaris**, Linn. *Marsh Pennywort*.

Divisions 1, 3, 4, 5, 6, 9, 10, 11, 13, 15, 17, and 18.

Less widespread in the southern area.

SANICULA, Linn. 150.

783. **S. europæa**, Linn. *Wood Sanicle*.

No records from divisions 1, 3, 8, 14, and 21.

CONIUM, Linn. 152.

785. **C. maculatum**, Linn. *Hemlock*.

All northern divisions except 6 and 10. Most plentiful in 4, 9, and 12. And the following southern records: 13. Weybridge. Walton. 17. Near Headley. 22. Southfleet.

SMYRNIUM, Linn. 153.

786. **S. Olusatrum**, Linn. *Alexanders*.

3. Towpath, Hampton Court. West Drayton. 21. Northfleet. Between Dartford and Littlebrook. 22. Stone Churchyard, and on road to Dartford.

BUPLEURUM, Linn. 154.

787. **B. rotundifolium**, Linn. *Hare's-ear*.

9. Chingford, as a garden casual.

789. **B. tenuissimum**, Linn.

21. Stone Marshes, on the sea wall.

APIUM, Linn. 156.

792. **A. graveolens**, Linn. *Wild Celery*.

2. Rickmansworth. 12. Rainham. 21. Littlebrook Marshes.

793. **A. nodiflorum**, Reichb. fl.

All divisions except 7 and 18, from the latter of which it may be absent.

795. **A. inundatum**, Reichb. fl.

4. Totteridge. Whitchurch Common. Stanmore. 5. Colney Furze Field. 9. Several localities in Epping Forest. 13. Abrook Common. 19. Limpsfield Chart. 20. Chislehurst Common.

(50) BOTANICAL RECORDS OF THE LONDON AREA.

CARUM, Linn. 158.

799. **C. segetum**, Benth. *Corn Parsley*.

12. Rainham. Grays. 21. Littlebrook Marshes. 23. Horton Kirkley, between Orpington and Green Street Green.

800. **C. Carvi**, Linn. *Caraway*.

3. West Drayton. Presumably an escape.

SISON, Linn. 159.

802. **S. Amomum**, Linn. *Stone Parsley*.

All northern divisions. More local on the southern side, and not yet recorded from divisions 14, 16, 22, 23, 24.

SIUM, Linn. 161.

805. **S. erectum**, Huds. *Water Parsnip*.

1. Iver. 2. Watford. Denham. 3. Yiewsley. 4. Uxbridge. Northwood gravel pits. 5. Aldenham. Colney Heath. 8. Broxbourne. R. Stort near Roydon. 14. Between Richmond and Kingston. 20. Near Eltham.

ÆGOPodium, Linn. 162.

806. **Æ. Podagraria**, Linn. *Goutweed*.

In all divisions except 21.

PIMPINELLA, Linn. 163.

807. **P. Saxifraga**, Linn. *Burnet Saxifrage*.

In all divisions except 14, 16 and 21.

808. **P. major**, Huds.

4. Between Woodside Park and Totteridge. 5. Arkley. 7. Cuffley. 8. Stansted Street. 17. Lane near Headley. Near Reigate. Burgh Heath. 18. Farthing Down. 19. Oxted. Limpsfield.

CONOPodium, Koch. 164.

809. **C. majus**, Loret. *Pig-nut*.

All divisions except 1, 15, 21, 23, 24.

MYRRHIS, Scop. 165.

810. **M. Odorata**, Scop. *Sweet Cicely*.

19. Hookwood, Limpsfield. Originally planted.

CHAEROPHYLLUM, Linn. 166.

811. **C. temulum**, Linn. *Rough Chervil*.

Divisions 1, 4, 5, 9 to 12, 14, 15, 17, 19 to 24.

More records in the south.

BRITISH
MUSEUM

1 SEP 32

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London Natural History Society.

THE SOCIETY is an amalgamation of the City of London Entomological and Natural History Society, founded in 1858, and the North London Natural History Society, founded in 1892.

Meetings are held on the First Four Tuesdays in each month, in the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. The room is open from 6 p.m. to 9 p.m., and meetings begin at 6.30 p.m. punctually, unless other arrangements are announced.

The CHINGFORD LOCAL BRANCH meets at the Avenue Café, opposite Chingford Station, at 8 p.m., on the Second Monday in each month.

At these meetings specimens in various branches of Natural History are exhibited, and papers on various subjects are read and discussed. Visitors are cordially welcomed on the introduction of a member of the Society.

The Minimum Annual Subscription for Members is 7s 6d, and for Associates 2s 6d. Each Member is entitled to one copy of "The London Naturalist" free; extra copies can be purchased by Members at two-thirds of the published price. All Subscriptions become due on January 1st, and should be sent direct to the Treasurer. Members elected after October 1st pay no Subscription for the year of their election.

New Members and Associates pay an entrance fee of 2s 6d.

The Subscription is fixed at as moderate a sum as is possible, having due regard to the proper maintenance of the Society and its work, in order that all may avail themselves of the benefits offered. The Society therefore looks with confidence for the support of all who are interested in the study of Natural History.

Further information may be obtained from the Secretary.

